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DEPARTMENT OF AGRICULTURE

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QUEENSLAND AGRICULTURAL JOURNAL

On a Dairy Farm in th Beaudesert Distri

LEADING FEATURES

Centro in the Mackay District
The Granite Belt
Making Hives
Molasses Grass
Cauliflower Varieties
Body Lice in Sheep
Dairy Buildings on the Atherton Tableland

Registered at the General Post Office, Brisbane, for transmission by Post as a Newspaper.

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(A list of extension services in southern Queensland will appear in our next issue.)

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Tuberculosis-Free Cattle Herds.

TESTED HERDS (As at 28th February, 1955).

The Tuberculosis-free Herd Scheme (which is distinct from the tuberculosis eradication scheme operating in commercial dairy herds) was initiated by the Department of Agriculture and Stock for the purpose of assisting owners of cattle studs to maintain their herds free from tuberculosis and so create a reservoir of tuberculosis-free cattle from which intending purchasers can draw their requirements.

The studs listed here have fulfilled the conditions to the date shown above.

Full particulars of the scheme and Agreement for Testing forms may be obtained from the Under Secretary, Department of Agriculture and Stock, Brisbane, or from Divisional Veterinary Officers throughout the State.

Breed.	Owner's Name and Address.
Aberdeen Angus ..	The Scottish Australian Company Ltd., Texas Station, Texas
A.I.S.	M. E. & E. Scott, "Wattlebrae" A.I.S. Stud, Kingaroy
	F. B. Sullivan, "Fermanagh," Pittsworth
	D. Sullivan, "Bantry" Stud, Rossvale, *via* Pittsworth
	W. Henschell, "Yarranvale," Yarranlea
	Con. O'Sullivan, "Navillus" Stud, Greenmount
	H. V. Littleton, "Wongalea" Stud, Hillview, Crow's Nest
	J. Phillips and Sons, "Sunny View," Benair, *via* Kingaroy
	Sullivan Bros., "Valera" Stud, Pittsworth
	Reushle Bros., "Reubydale" Stud, Ravensbourne
	H. F. Marquardt, "Chelmer" Stud, Wondai
	A. C. and C. R. Marquardt, "Cedar Valley," Wondai
	A. H. Sokoll, "Sunny Crest" Stud, Wondai
	W. and A. G. Scott, "Welena" A.I.S. Stud, Blackbutt
	G. Sperling, "Kooravale" Stud, Kooralgin, *via* Cooyar
	C. J. Schloss, "Shady Glen," Rocky Creek, Yarraman
	W. H. Thompson, "Alfa Vale," Nanango
	S. R. Moore, Sunnyside, West Wooroolin
	H.M. State Farm, Numinbah
	D. G. Neale, "Groveley," Greenmount
	Edwards Bros., "Spring Valley" A.I.S. Stud, Kingaroy
	A. W. Wieland, "Milhaven" A.I.S. Stud, Milford, *via* Boonah
	W. D. Davis, "Wamba" Stud, Chinchilla
	Queensland Agricultural High School and College, Lawes
	C. K. Roche, Freestone, Warwick
	Mrs K. Henry, Greenmount
	D. R. Green, Deloraine Stud, Durong, Proston
	E. Evans, Wootha, Maleny
Ayrshire	L. Holmes, "Benbecula," Yarranlea
	J. N. Scott, "Auchen Eden," Camp Mountain
	"St. Christopher's" and "Iona" Studs, Brookfield road, Brisbane
	E. Mathie and Son, "Ainslie" Ayrshire Stud, Maleny
	C. E. R. Dudgeon, "Marionville" Ayrshire Stud, Landsborough
	G. F. H. Zerner, "Pineville," Pie Creek, Box 5, P.O., Gympie
	T. F. Dunn, Alanbank, Gleneagle
Friesian	C. H. Naumann, "Yarrabine" Stud, Yarraman
Guernsey	C. D. Holmes, "Springview," Yarraman
	A. B. Fletcher, Cossart Vale, Boonah
	W. H. Doss, Degilbo, *via* Biggenden
	A. C. Swendson, Coolabunia, Box 26, Kingaroy
	C. Scott, "Coralgrae," Din Din road, Nanango
Jersey	Queensland Agricultural High School and College, Lawes
	J. S. McCarthy, "Glen Erin" Jersey Stud, Greenmount
	J. F. Lau, "Rosallen" Jersey Stud, Goombungee
	G. Harley, Hopewell, M.S. 189, Kingaroy
	Toowoomba Mental Hospital, Willowburn
	Farm Home for Boys, Westbrook
	F. J. Cox and Sons, "Rosel" Stud, Crawford, Kingaroy Line
	R. J. Browne, Hill 60, Yangan
	P. J. L. Bygrave, "The Craigan Farm," Aspley
	R. J. Crawford, "Inverlaw" Jersey Stud, Inverlaw, Kingaroy
	P. H. F. Gregory, "Carlton," Rosevale, *via* Rosewood
	E. A. Matthews, "Yarradale," Yarraman
	A. L. Semgreen, "Tecoma," Coolabunia
	L. E. Meier, "Ardath" Stud, Boonah
	A. M. and L. J. Noone, "Winbirra" Stud, Mt. Esk Pocket, Esk
	W. S. Conochie and Sons, "Brookland" Stud, Sherwood road, Sherwood
	Estate of J. A. Scott, "Kiaora," Manumbar road, Nanango
	F. W. Verrall, "Coleburn," Walloon
	C. Beckingham, Trouts road, Everton Park
	W. E. O. Meier and Son, "Kingsford" Stud, Alberton, *via* Yatala
	G. H. Ralph, "Ryecombe," Ravensbourne
	Mrs. I. L. M. Borchert, "Willowbank" Jersey Stud, Kingaroy
	W. and C. E. Tudor, "Boree" Jersey Stud, M.S. 498, Gayndah
	Weldon Bros., "Gleneden" Jersey Stud, Upper Yarraman
	D. R. Hutton, "Bellgarth," Cunningham, *via* Warwick
	J. W. Carpenter, Flagstone Creek, Helidon
	H. G. Johnson, "Windsor" Jersey Stud, Beaudesert
	W. S. Kirby, Tinana, Maryborough
Polled Hereford ..	W. Maller, "Boreview," Pickanjinnie
	J. H. Anderson, "Inverary," Yandilla
	D. R. and M. E. Hutton, "Bellgarth," Cunningham, *via* Warwick
	E. W. G. McCamley, Eulogie Park, Dululu
	Wilson and McDouall, Calliope Station, Calliope

Centro in the Mackay Agricultural District.

By N. E. GOODCHILD, Senior Adviser in Agriculture.

The legume centro (*Centrosema pubescens* Benth.) is a tropical pasture species which has shown great promise in grazing trials in northern coastal Queensland.

It is grown in combination with Guinea grass (*Panicum maximum*) at the Bureau of Tropical Agriculture near Innisfail, under the natural rainfall conditions of approximately 150 inches per year. Under a system of rotational grazing this mixture has fattened cattle at the rate of 1 beast to 1¼ acres for 7 years without detriment to the pasture.

At the Ayr Regional Experiment Station centro has been grown successfully under irrigation in combination with para grass (*Brachiaria mutica*).

Plate 1.

Centro Beating Blady Grass at Walkerston, Mackay. This stand is 14 years old.

Plate 2.

Centro in a Spray Irrigated Plot at Homebush, Mackay. This stand is 3 years old and has been mown and grazed.

This mixture has carried and fattened cattle at the rate of two beasts to the acre.

Description.

A native of South America, centro is a perennial twining plant which makes vigorous growth under favourable conditions. It shows a marked tendency to climb, and provides a dense ground cover. The plant is a heavy seeder, but as the pods do not mature uniformly some difficulty is experienced in harvesting large quantities of seed.

In common with other pasture legumes, centro fixes atmospheric nitrogen with the aid of root nodule bacteria. This nitrogen is later made available to the grass component of the pasture with a resultant increase in pasture productivity. This has been particularly noticeable in the Guinea grass/centro pasture mixture at the Bureau of Tropical Agriculture. In these pastures the grass is darker green and obviously more palatable to stock than neighbouring areas of Guinea grass pasture which have no centro component.

The legume has a high protein value, ranging from 15% to 23% according to stage of growth. It is readily grazed by stock once they become accustomed to it.

Climatic Requirements.

Centro is a summer-growing legume. For maximum development it requires frost-free conditions and an annual rainfall in excess of 80 inches spread over the summer months.

The plant will, however, grow in areas subject to occasional frosts. Under these conditions the young succulent top growth is destroyed, but the dense foliage protects the more

mature stems and runners from damage. Recovery from frost injury is rapid once the temperatures begin to rise in the spring.

The leaf remains green and palatable during late autumn and early winter prior to the onset of frost, even though growth may have virtually ceased.

Behaviour in the Mackay District.

The behaviour of centro in three different areas of the Mackay district shows that this legume may be of considerable value in this region.

In the Walkerston area centro has successfully beaten blady grass on a moderately fertile shallow brown loam soil overlying a shaley clay.

The centro was sown in 1940 in a rough seedbed prepared by opening shallow furrows through a dense patch of blady grass. Despite the fact that only an irregular stand was obtained, the legume developed vigorously. The aggressive viney growth has extended to cover an area of approximately one acre. It has completely smothered the blady grass (Plate 1) and is still growing strongly 14 years after establishment.

The plot is subject to occasional frosts, and has been burnt out several times. The area is fenced and stock are admitted at irregular intervals. Following damage by frost or fire, or after grazing, regrowth is made from the crown and also from the mature runners at ground level.

In 1947, half an acre was planted on a poor grey sandy loam in the Homebush area. This planting persisted until 1951, when the land was required for other crops. Periodical heavy grazing by dairy cattle was carried out with no detriment to the stand.

Plate 3.

Centro in a Papaw Plantation at Mt. Jukes, Mackay. The legume is 3 years old. This illustrates the climbing habit of centro, which is an advantage for combating weeds but may be disadvantageous in an orchard.

It was found to be palatable to the stock as pasture and also when cut and fed as hay (Plate 2).

Value as Cover Crop.

The value of centro as a cover crop was shown in the Mt. Jukes district. The legume was planted in hills

approximately 6 feet apart between well established rows of papaws on a brown loam soil originally under light scrub.

Establishment was rather slow, but within six months a large number of vigorous runners was produced. These runners, which were up to 8 feet in length, sent down roots at the nodes which were 3-4 inches apart.

A dense cover 12-18 inches in depth was produced, which completely smothered all weed growth, while the carpet of rooted runners effectively prevented soil erosion (Plate 3).

Its vigorous climbing habit necessitated constant cutting back of the runners, which would otherwise overrun the papaw trees. This is a serious disadvantage in plantations.

Seed Production.

Imported seed is now available in quantity from seed merchants. The cost in Mackay in 1954 was approximately 6s. per lb. Seed from existing stands may be harvested by cutting fully seeded plants and rolling them into bundles for curing. The seed is then threshed out by flailing. The plant crowns are not destroyed by this treatment.

The butts of 3-year-old plants may be up to 2 inches in diameter. Even though cut up to 3 inches below ground level the plants make vigorous regrowth from the root butts and again produce a massive ground cover.

Planting.

Quickest establishment of centro is obtained from plantings made on well prepared, fallowed land. Experience in the Mackay district has shown that this plant will compete successfully with blady grass, even when sown in roughly prepared drills in dense blady grass stands.

In cultivated land in the frost-free areas near Mackay, seeds planted at 6-ft. intervals have given a complete ground cover 12-18 inches deep in 6 months.

A planting rate of 1-2 lb. per acre would be sufficient under these conditions, but as cheap seed is readily available, it is recommended that a rate of 3-4 lb. per acre be used where rapid establishment is essential.

VOL. III. OF THE "QUEENSLAND AGRICULTURAL AND PASTORAL HANDBOOK."

"INSECT PESTS AND DISEASES OF PLANTS."

This book holds a wealth of information on pests and diseases affecting cultivated plants in Queensland. It contains 560 pages and over 300 illustrations.

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Molasses Grass.

BY OFFICERS OF THE AGRICULTURE BRANCH.

Molasses grass (*Melinis minutiflora* Beauv.) was introduced to Queensland some 40-50 years ago from tropical South America. The grass is a native of Africa and is now widely spread in tropical areas throughout the world. Whilst useful productivity has been recorded from tropical lowlands, the grass has been grown to best advantage on warm tropical uplands on soils with suitable fertility and drainage.

In Queensland the main areas of distribution are along the tropical eastern coastlands from Rockhampton to the Daintree. Successful establishment has also been recorded on the Atherton Tableland, Eungella Tableland, Blackall Range and south-eastern coastlands where drainage is satisfactory.

Description.

Molasses grass is a perennial tufted grass of straggling habit, each crown producing a large number of trailing stems up to six feet long and reaching a height of two feet or more.

Under suitable conditions, it is a very rapid grower, spreading quickly by means of the creeping stems and smothering out other growth by the dense mat which it forms. This habit makes the grass a useful pioneer pasture plant, with the ability to cover an area quickly to the exclusion of weeds. The planting of molasses grass following the burning of scrublands has been widely practised in North Queensland. With care in management, such stands will readily control aggressive tropical weed growth.

Molasses grass has a strong and distinctive smell, due to the presence in the leaf of a volatile oil. In addition, the leaves exude a sticky secretion.

The seeds are borne on a small plume-like seedhead with short branches. These seedheads are of a striking reddish-brown colour, and project well above the mat of leaves and stems. Flowering occurs rather suddenly and in the course of a day or two a green paddock of molasses grass can be transformed to a field of waving red-brown seedheads.

Climatic Requirements.

Molasses grass is essentially a tropical grass which cannot tolerate temperatures below about 27°F. Observations in recent years have shown that the grass will withstand a considerable period of light frosting without actual plant loss. Serious frost "browning" may occur, but vigorous regrowth is again noted during the summer months.

In Queensland the grass has shown considerable drought resistance. However, it makes its most vigorous growth on the wet tropical coastal areas with good drainage.

Soil Requirements.

Molasses grass, whilst showing its best growth on the moist, well-drained scrub soils of North Queensland, can nevertheless be grown on a variety of poorer soil types, particularly if some attention is paid to fertility and drainage.

Excellent growth has been recorded on acid yellow clay loams at Cooroy and on poor sandstone soils in the Brisbane district, as well as on the deep red loams in the Innisfail district.

For maximum growth an adequate supply of nitrates and phosphates is necessary. In areas of doubtful fertility, therefore, more rapid establishment is obtained if a fertilizer mixture containing sulphate of ammonia and superphosphate is applied at planting time.

Molasses grass will tolerate acid soils but will not grow successfully on areas subject to seasonal high water-table levels or on areas subject to periodic flooding.

Plate 1.

A Molasses Grass Plot at Moggill, Brisbane, in 1954. The molasses grass is the spreading grass in the middle of the picture. On these sandy ridge soils, this grass makes an excellent cover, and though it is checked by frost each winter, it recovers quickly in the spring.

Planting.

Molasses grass seed is readily available, and as the germination capacity of a large proportion of the commercial seed is not particularly high a 30% germination standard has been set under the Agricultural Standards Act.

The seeds of molasses grass are extremely light and tend to cling together. Planting therefore poses a problem. Sowing rates of 2-4 lb. per acre are recommended and an inert carrier such as sawdust should be used to give a more even distribution. Sawdust is an effective carrier if care is taken to make sure that any seed masses are broken up and that the sawdust and seed are thoroughly mixed. Such a mixture is easily broadcast, ensuring a satisfactory seed coverage.

Machine-planting is seldom carried out as the grass is usually grown on rough difficult country or in areas where machinery is not available. However, if mixed with sieved sawdust the seed should run satisfactorily through most seed and/or fertilizer drills.

The seed should be sown during spring or summer, either following a scrub burn or on cultivated land. A good seedbed of ashes or disturbed soil is necessary for good establishment, and to ensure rapid growth and early ground coverage.

Establishment from stem cuttings is possible, but this practice is not widely carried out, as the sowing of seed is far less costly.

In many instances molasses grass is sown alone, but in high rainfall areas it is frequently sown in grass mixtures. Where the final object is to establish guinea grass or para grass pastures, an initial planting of molasses grass has been found useful in checking undergrowth while the slower grasses are developing. The molasses grass also provides a medium whereby a good fire can be secured for the destruction of fallen timber.

The value of molasses grass in the control of blady grass and bracken fern has been amply demonstrated and observed at Atherton, South Johnstone and Cooroy. Greater future use is expected to be made of this grass for similar weed control work in other areas. For such purposes the grass is sown in the ashes following a burn of the weed-infested area, or in the seedbed formed after discing or ploughing the area.

The pioneering ability of this grass with its capacity to smother weeds and provide an early ground cover makes it a useful grass to sow with such prolific permanent pasture legumes as centro and puero. Work along these lines has been successfully established at South Johnstone and elsewhere in the Innisfail district, where excellent pasturage capable of high stocking has been obtained.

Plate 2.

Molasses Grass on Hillside Country at Cooroy in 1953. The grass has successfully invaded narrow-leaf carpet grass, and is here flowering freely.

Plate 3.

Molasses Grass in Full Flower. This picture was taken in hilly country near Cooroy in June, 1953.

Management.

Protection from stock and from fire is essential during early establishment. The grass has its growing buds above the ground and is consequently unsuited to conditions of continuous heavy grazing. Molasses grass, possibly more than any other grass, will respond to rotational grazing. Excessive grazing will seriously reduce the plant vigour, often to the extent that the grass may be entirely suppressed by vigorous weeds. However, if molasses grass pasture is grazed down to a height of 6-9 in. and then allowed to make regrowth to a height of approximately 14-18 in. before again being grazed, it will last for many years.

Seasonal growth patterns in south-eastern Queensland have indicated that molasses grass is in need of sound management, particularly in the pre-flowering period of April to mid-June. In this district flowering is usually at its peak in early June. Following seed fall, stocking can be resumed until the grass has again been reduced to the recommended grazing height. On soils of poor fertility wide grazing cycles may be necessary.

At the Bureau of Tropical Agriculture at South Johnstone, molasses grass pastures have survived six years' grazing at the rate of 1 beast to 1¼ acres on a system which provides for 7 days of grazing followed by 28 days of rest. A carrying capacity of 1 beast to 1 acre, however, seriously damaged the molasses grass pasture in one year. There is also evidence to show that *continuous* grazing at 1 beast to 1¼ acres is too severe for this grass.

Management in any district must be related to local knowledge of soil fertility, stocking and rainfall conditions, and a suitable pattern worked

Plate 4.

A Good Stand of Molasses Grass on a Coastal Farm in South Queensland. The tall weeds in the foreground are the so-called "wild tobacco". They have not been suppressed by the grass, but their development has been greatly restricted by it.

out accordingly. Small paddocks with adequate shade and watering facilities are essential.

Molasses grass will readily fire and burns with an intense heat. This characteristic is often made use of in scrub land to assist in the burning of dead timber, weeds and other rubbish. However, firing can effectively destroy a well established stand of this grass, and should not be undertaken if a permanent molasses grass pasture is desired.

Molasses grass paddocks destroyed by fire will quickly revert to such vigorous tropical weeds as wild tobacco, inkweed and lantana, and many pastures in the Palmerston area have been ruined in this manner. If firing is considered essential for weed control, the initial molasses grass sowing should include such hardy grasses as Guinea and para, to overcome the possibility of total pasture loss.

Conservation.

In South America molasses grass is often conserved as hay or silage, but such practices are rarely carried out in Queensland. Molasses grass has been mainly established in areas too steep or too undulating for access by haymaking machinery and its main use has thus been as pasture.

Feeding Value.

It has been reported that in some areas stock at first show a distinct distaste for molasses grass, but on well established pastures they readily become accustomed to it. The sweet characteristic smell of molasses grass might suggest that dairy cattle grazed on this grass would automatically produce tainted milk or cream, but

this is not the case. Tests carried out at Cooroy show that the aromatic flavours are not passed on through the cattle to the dairy produce.

All cattle appear to grow satisfactorily on molasses grass. Dairy cattle produce equally well on this grass as on other tropical pasture grasses.

The composition of molasses grasses at four stages of growth is shown in the following table.

The annual productivity of this grass under high rainfall conditions under a rotational grazing system of 7 days stocking and 28 days spell, and at the rate of 1 beast to 1¼ acres, has been 11.32 tons per acre (green weight).

MOLASSES GRASS.

Analysis of Water-Free Material.

Description of Sample.	Crude Protein.	Crude Fat.	Carbohydrate.	Crude Fibre.	Ash.	CaO.	P_2O_5.
	%	%	%	%	%	%	%
Sample cut wet season	14·9	2·6	52·5	35·1	10·1	0·513	0·940
Sample cut dry season	8·4	1·3	45·4	29·3	6·2	0·315	0·415
Young growth ..	11·9	1·4	..	28·4	..	0·244	0·239
Coarse growth after seeding	3·3	0·8	..	40·8	..	0·416	0·172

Plate 5.

A Mixed Pasture of Molasses Grass and Stylo. This pasture was established in a high-rainfall, "scrub" area near Innisfail, and provided a good blending of grass and legume.

Seed Production.

Seed production in Queensland is confined mainly to North Queensland and is carried out in the Innisfail, Kuranda and Myola areas. Hand harvesting is undertaken in the months of May to July, and with experience seed of good quality may be obtained.

The seed of molasses grass is extremely light and is found to average nearly six million seeds per pound. At a planting rate of 5 lb. per acre, this would give 202 viable seeds per sq. foot at a germination standard of 30%

Mechanical harvesting of seed does not appear to be practicable in view of the extreme lightness of the seed and because of the difficulty of operating machinery on the terrain where seed production is normally carried out.

Pests and Diseases.

No trouble from pests and diseases has been experienced in Queensland.

Special Uses.

Molasses grass shows particular promise in a number of coastal districts for the control of bracken fern, blady grass and other scrub weeds.

It has also been widely sown on gully faces, where it serves as a useful soil binder to prevent soil loss. Some use may be made of this valuable grass in coastal soil conservation projects as a quick-growing waterway cover.

HAVE YOUR SEEDS TESTED FREE

The Department of Agriculture and Stock examines FREE OF CHARGE samples representing seed purchased by farmers for their own sowing.

The sample submitted should be representative of the bulk and a covering letter should be sent advising despatch of the sample.

MARK YOUR SAMPLE

Sample of _____ seed
Drawn from _____ bags
Representing a total of .....
Purchased from .....
Name and Address of Sender
Date .....

SIZE OF SAMPLE

Barley	8 oz.	Oats	8 oz.
Beans	8 oz.	Peas	8 oz.
Grasses	2 oz.	Sorghum	4 oz
Lucerne	4 oz.	Sudan	4 oz.
Millets	4 oz.	Wheat	8 oz.

Vegetable Seeds - ½ oz.

SEND YOUR SAMPLE TO—**STANDARDS OFFICER, DEPARTMENT OF AGRICULTURE AND STOCK, BRISBANE.**

Brucellosis-Tested Swine Herds.

A herd listed by the Department as "brucellosis tested" is one in which all such animals as may be determined by the Director of the Department's Division of Animal Industry have been subjected to two successive tests for brucellosis, at intervals determined by him, without any positive reactors being found. A semi-annual or annual re-test of the herd, as determined by the Director, is required.

TESTED HERDS (As at 28th February, 1955).

Berkshire.

A. P. and N. Beatty, "Deepdene," Barambah road, Nanango
S. Cochrane, "Stanroy" Stud, Felton
G. Handley, "Handleigh" Stud, Murphy's Creek
J. L. Handley, "Meadow Vale" Stud, Lockyer
O'Brien and Hickey, "Kildurham" Stud, Jandowae East
G. C. Traves, "Wynwood" Stud, Oakey
E. Tumbridge, "Bidwell" Stud, Oakey
Westbrook Farm Home for Boys, Westbrook
M. K. Collins, "Kennington" Stud, Underwood road, Eight Mile Plains
H.M. State Farm, "Palen" Stud, Palen Creek
H. L. Ludwig, "Beau View" Stud, Beaudesert
H. H. Sellars, "Tabooba" Stud, Beaudesert
D. T. Law, "Rossvill" Stud, Trouts road, Aspley
R. H. Crawley, "Rockthorpe" Stud, *via* Pittsworth
F. R. J. Cook, Middle Creek, Pomona
Mrs. I. M. James, "Kenmore" Stud, Cambooya
H. L. Stark, "Florida," Kalbar
J. H. N. Stoodley, "Stoodville," Ormiston
H.M. State Farm, Numinbah
V. G. M. and A. G. Brown, "Burdell," Goovigen
N. F. Cooper, Maidenwell
R. H. Coller, Tallegalla, *via* Rosewood
E. J. Clarke, "Kaloon" Stud, Templin
M. G. and R. H. Atkins, "Diamond Valley" Stud, Mooloolah
L. Puschmann, "Tayfeld" Stud, Taylor
Dr. B. J. Butcher and A. J. Parnwell, "Hartley Grange" Stud, 684 Logan Road, Greenslopes
C. E. Edwards, "Spring Valley" Stud, Kingaroy
G. McLennan, "Murcott" Stud, Willowvale
H. M. Wyatte, "Deepwater" Stud, Rocky Creek, Yarraman
C. F. W. and B. A. Shellback, "Redvilla" Stud, Kingaroy
R. J. Webber, "Webberberry" Stud, 35 Caxton st., Petrie Terrace
J. C. Lees, "Bridge View" Stud, Yandina
F. Thomas, "Rosevale" Stud. M.S. 373, Beaudesert
A. C. Fletcher, "Myola" Stud, Jimbour
Q.A.H.S. and College, Lawes
E. F. Smythe, "Grandmere" Stud, Manyung, Murgon
The Marsden Home for Boys, Kallangur
M. F. Callaghan, Lower Mount Walker, via Rosewood
J. B. Lotz, M.S. 794, Kalbar
G. J. Hutton, Woodford

Large White.

H. J. Franke and Sons, "Delvue" Stud, Cawdor
Garrawin Stud Farm Pty. Ltd., 657 Sandgate road, Clayfield
J. A. Heading, "Highfields," Murgon
K. B. Jones, "Cefn" Stud, Pilton
R. Postle, "Yarralla" Stud, Pittsworth
B. J. Jensen, "Bremerside" Stud, Rosevale, *via* Rosewood
E. J. Bell, "Dorne" Stud, Chinchilla
L. C. Lobegeiger, "Bremer Valley" Stud, Moorang, *via* Rosewood
H. R. Gibson, "Thistleton" Stud, Maleny
H.M. State Farm, Numinbah
K. A. Hancock, "Laurestonvale" Stud, Murgon
V. P. McGoldrick, "Fairymeadow" Stud, Cooroy
S. T. Fowler, "Kenstan" Stud, Pittsworth
M. D. Power. "Ballinasloe" Stud, Swan Creek, *via* Warwick
H. L. Larsen, "Oakway," Kingaroy
Mrs. I. G. Utting, "White Lodge," Mountain road, Cooroy
N. E. Meyers, Halpine Plantation, Kallangur
Dr. B. J. Butcher and A. J. Parnwell, 684 Logan road, Greenslopes
G. I. Skyring, "Bellwood" Stud, *via* Pomona
O. J. Horton, "Manneum Brae" Stud, Manneum, Kingaroy
F. K. Wright, Narangba, N. C. Line
O. B. Vidler, Manneum, Kingaroy
K. F. Stumer, French's Creek, Boonah
Q.A.H.S. and College, Lawes
R. S. Powell, "Kybong" Stud, Kybong, *via* Gympie
F. G. Rigby "Ingleborough," Kobble, Dayboro Line
S. and S. Ouglitchinin, "Pinefields," Old Gympie road, Kallangur
C. Wharton, "Central Burnett" Stud, Gayndah

Tamworth.

S. Kanowski, "Miecho" Stud, Pinelands
N. R. Potter, "Actonvale" Stud, Wellcamp
D. F. L. Skerman, "Waverley" Stud, Kaimkillenbun
A. C. Fletcher, "Myola" Stud, Jimbour
Salvation Army Home for Boys, "Canaan" Stud, Riverview
A. J. Surman, "Namrus" Stud, Noble road, Goodna
Department of Agriculture and Stock, Regional Experiment Station, Kairi
E. C. Phillips, "Sunny View," M.S. 90, Kingaroy
F. N. Hales, Kerry road, Beaudesert
T. A. Stephen, "Withcott," Helidon
W. F. Kajewski, "Glenroy" Stud, Glencoe
A. A. Herbst, "Hillbanside" Stud, Bahr Scrub, *via* Beenleigh
H.M. State Farm, Numinbah
D. B. Alexander, "Debreczen" Stud, Kinleymore, *via* Murgon
Dr. B. J. Butcher and A. J. Parnwell, 684 Logan road, Greenslopes
G. H. Sattler, Landsborough
F. Thomas, "Rosevale" Stud, M.S. 373, Beaudesert
P. V. Campbell, "Lawn Hill" Stud, Lamington
H. J. Armstrong, "Alhambra," Crownthorpe, Murgon
Q.A.H.S. and College, Lawes
R. H. Coller, Tallegalla, *via* Rosewood

Wessex Saddleback.

W. S. Douglas, "Greylight" Stud, Goombungee
J. Gleeson, "Iona Vale" Stud, Kuraby
C. R. Smith, "Belton Park" Stud, Nara
H. H. Sellars, "Tabooba" Stud, Beaudesert
H. Thomas, "Eurara" Stud, Beaudesert
D. T. Law, "Rossvill" Stud, Trout road, Aspley
J. B. Dunlop, "Kurrawyn" Stud, Acacia road, Kuraby
F. K. Wright, Narangba, N. C. Line
G. J. Hutton, Woodford
R. A. Collings, "Rutholme" Stud, Waterford
W. R. Dean, "Trelawn," Tandur, *via* Gympie
M. Nielsen, "Cressbrook" Stud, Goomburra
G. J. Cooper, "Cedar Glen" Stud, Yarraman
Mrs. R. A. Melville, "Wattledale Stud," Beenleigh road, Sunnybank
A. J. Stewart, "Springbrook," Pie Creek road, Gympie
S. and S. Ouglitchinin, "Pinefields," Old Gympie road, Kallangur
R. J. Hicks, M.S. 98, Darlington, *via* Beaudesert

British Large Black.

H. W. Naumann, "Parkdale" Stud, Kalbar

Horticultural Districts of Queensland.

1. THE GRANITE BELT.*

By M. A. HANNIGAN, Senior Adviser in Horticulture.

Although the Granite Belt is situated only five degrees latitude south of the Tropic of Capricorn, its altitude (2,500-3,500 ft.) ensures a more or less temperate climate which is sufficiently cold during the winter to provide the chilling requirements of deciduous fruit trees.

With the exception of a few apricot orchards near Warwick and some peach orchards near Brisbane, commercial production of pome and stone fruits in Queensland is restricted to this district. Grapes are also an important crop and about 80% of the vineyards in the State are established in the area. In addition, the Granite Belt is the principal source of vegetables for Brisbane and other Queensland markets during the summer months.

The Granite Belt (Plate 1) is an area of rugged, seemingly inhospitable country extending from Wallangarra on the Queensland-New South Wales border to Dalveen on its northern boundary. It is approximately 40 miles long and from 10 to 17 miles wide. Stanthorpe (Plate 2), which is the main town, is located almost in the centre of the district and services a population of some 7,760 people.

The district is well served by rail, road and air services to Brisbane, the capital city, which is about 140 miles distant by road.

HISTORICAL DEVELOPMENT.

Settlement of the district began in 1872 with the discovery of tin and the immediate development of mining operations; hence the name Stanthorpe, which is derived from *stannum* (tin) and *thorpe* (village).

Apple trees and grape vines were first planted in 1873 and the area under these crops increased greatly after 1880, when the mining boom had passed its peak. After the first World War, considerable development took place in fruit production, the chief reason being the establishment of Soldier Settlement Projects in the Pikedale area, where new townships were established and given names such as Pozieres, Amiens, Bullecourt, Bapaume and Fleurbaix to commemorate the battles in which Australian troops took part.

The pioneer growers had many production problems but these were gradually overcome, and in 1929 the first consignment of apples was exported to the United Kingdom. An appreciable quantity of apples was exported annually until 1939. During the past decade cool store facilities have been expanded a great deal and the marketing season in Australia for the principal varieties of apples has been extended. As a result, the bulk of the produce is now sold on the Australian market.

* This article brings up to date that on the same subject published in 1949.

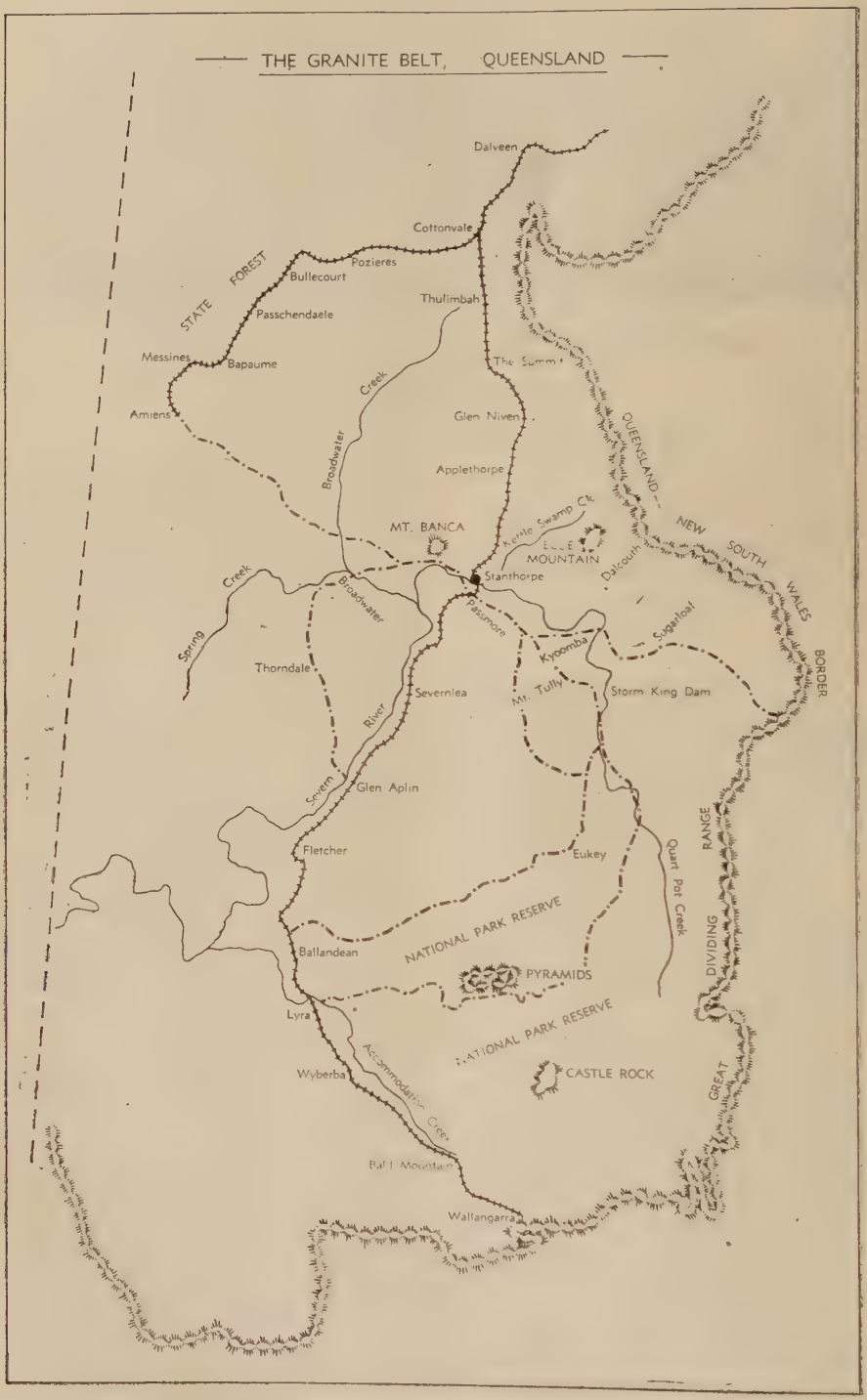

Plate 1.

Sketch Map of the Granite Belt.

Plate 2.

Stanthorpe, Main Business Centre of the Granite Belt.

CLIMATE.

The Granite Belt plateau is a continuation of the New England plateau of northern New South Wales and its climate is temperate in character. Sharp fluctuations in temperatures are, however, common, especially at critical periods of the year such as early spring, when late frosts sometimes cause heavy losses of newly set fruit. Winter temperatures are, however, cool enough in most years to satisfy the chilling requirements of all pome and stone fruits with the possible exception of some early varieties of peach.

TABLE 1.

Climatic Data—Stanthorpe.

—	January.	February.	March.	April.	May.	June.	July.
Mean maximum temperature in °F.	81·1	79·6	76·0	72·6	64·3	58·7	57·3
Mean minimum temperature in °F.	59·0	59·1	55·6	50·4	40·7	36·6	33·2
Average rainfall in points ..	359	328	270	172	185	196	203

—	August.	September.	October.	November.	December.	Year.
Mean maximum temperature in °F.	60·8	66·8	73·5	78·4	80·9	70·8
Mean minimum temperature in °F.	35·0	40·9	47·8	53·4	56·8	47·4
Average rainfall in points..	182	228	255	269	351	2,998

The record low grass temperature reading is 5.7°F. and grass readings of from 10 to 20°F. occur fairly regularly in most winters during June and July. Summer temperatures sometimes reach 95°F. and cause damage to fruit trees, especially if soil moisture is at a low level and the trees are suffering from stress conditions.

The average annual rainfall of 30 inches is near the minimum required for the commercial production of deciduous fruit. Fortunately, the bulk of the rain falls during summer and early autumn, when adequate soil moisture is essential for tree growth and bud formation, particularly in the apple, which is the most important crop.

The southern part of the district is, however, bordered on the east by a high range of hills which partly check the westward drift of light rains from the coast. These can be harmful to stone fruit and grapes when these crops are approaching maturity. It is not surprising, therefore, that practically all the grapes and the major portion of the stone fruits produced in the Granite Belt are grown in this area.

Hailstorms during spring and early summer are not uncommon and it is seldom that a year passes without some part or parts of the the district experiencing losses of fruit from hail.

SOILS.

As is suggested by its name, the soils of the Granite Belt are derived from granite rocks. Medium- to fine-grained loams occur mainly in the northern part of the district, where the surface soil ranges from 9 to 12 inches in depth and invariably overlies a permeable clay subsoil. Most of the apple orchards are established on this soil type.

The coarse-grained loams are found mostly on the hillsides and valleys in the southern end of the district. The surface layers in these soil types are much deeper than those in the medium- to fine-grained loams and they are extensively used for stone fruits and grapes. Alluvial soils occur mainly on flat land adjacent to rivers,

Plate 3.

A Green Manure Crop of New Zealand Blue Lupin Just Prior to Discing in Autumn.

creeks and gullies; they are widely used for the production of vegetables and to a lesser extent pears.

Typical granitic soils erode very easily during periods of heavy rain and the loss of topsoil has certainly lowered productivity on many farms. This has led to a grower appreciation of the need for efficient methods of soil management. Green manuring (Plate 3) is now widely practised, New Zealand blue lupin being the principal cover crop; it is established in late February or March and usually makes excellent growth before it is disced into the ground in August. Contour planting is also attracting attention in areas where young orchards are being established.

TABLE 2.

Granite Belt Production Data (1953–54).

Crop.	Production.	Acreage under Crop.		
		Bearing. (Acres.)	Non-bearing.	Total. (Acres.)
Apples	550,408 bushels	5,465	4,140	9,605
Pears	29,178 bushels	291	113	404
Plums	117,358 ½-bushels	1,047	358	1,405
Peaches	124,855 ½-bushels	1,410	388	1,798
Apricots	24,022 ½-bushels	266	68	334
Grapes	137,377 ½-bushels	1,800	150	1,950
Tomatoes	206,884 ½-bushels	..	..	1,250
Beans (French)	60,179 bags	..	..	921
Cabbages and Cauliflowers ..	76,376 dozen	..	..	639
Green Peas	13,112 bushels	..	..	289
Carrots	4,186 cwt.	..	..	104
Cucumbers	5,739 bushels	..	..	88

HORTICULTURAL USES.

Fruit and vegetable production in the Granite Belt is summarised in Table 2. Of the several fruits, apples, plums, peaches and grapes are by far the most important to the district. Tomatoes are the principal vegetable crop but substantial quantities of beans and cabbages are grown each year to meet the requirements of the Queensland market. Yields from tree fruits vary a great deal and may be reduced appreciably in years when spring frosts and/or hail are troublesome. Nevertheless, they fluctuate less than in the case of vegetables, for dry weather in spring is not uncommon and may be responsible for the more or less total failure of small crops planted at that time of the year.

During the last 7 years, some 5,300 acres of land have been planted to deciduous fruits in the Granite Belt and of this area approximately 80% are apples. It is estimated that by 1960 apple production in the district will reach 1,000,000 bushels per year.

Suitable virgin land is available for further expansion of both the fruit and vegetable industries in the Granite Belt if the demand on local and overseas markets continues.

Apples.

The average annual production of apples ranges from 450,000 to 550,000 bushel cases. In pioneering days it was the practice to plant a wide range of varieties but today only those of recognised value are grown commercially. Attention was first focussed on the need for limiting the number of varieties grown when the export of apples began in 1929, for good keeping varieties commanded a premium on the market at that time. The popularity of these varieties has increased with the erection of cool stores in the district, the present

capacity of which is about 188,000 bushel cases. The importance of the several varieties is indicated by the following analysis of plantings during the period 1947-1952:—Granny Smith, 40%; Delicious, 35%; Jonathan 12%; Gravenstein, 7%; others, 6%.

The Granny Smith is a late-maturing variety which stores well and is popular on both the local and export markets; it is a green apple suitable for both cooking and dessert purposes. The mid-season Delicious is still the best red apple for Stanthorpe, mainly because of its value as a dessert variety and the ease with which it can be stored.

Although earlier maturing varieties are grown on a fairly extensive scale, most of them have characteristic

Plate 4.

Plum Tree at the Commencement of Blossoming.

defects either in the tree itself or in the quality of the fruit. Gravenstein holds pride of place as the best early cooking and dessert apple in the district even though the tree is usually not long-lived. Jonathan and Macintosh Red apples are mid-season red varieties which meet a ready sale on the local markets.

Plate 5.

Pear Orchard (Packham's Triumph) at The Summit.

Pears.

The main commercial varieties of pear (Plate 5) grown at Stanthorpe are Packham's Triumph, Williams Bon Chretien and Winter Cole. Packham's Triumph and Williams Bon Chretien are stored for a short period and sold *ex* cool stores according to market requirements.

Plums.

Several varieties of plums (Plate 4) are grown commercially, the more important being Wilson, Santa Rosa, Burbank and Doris (all Japanese types) and Angelina and President, two European varieties.

Peaches.

Peach varieties include early, mid-season and late-season types but the fruit quality in the early-maturing varieties is not particularly good at Stanthorpe. The main early varieties in their order of importance are Wiggins, Mayflower and High's Early Canada. Mid-season varieties are limited mainly to Blackburn Elberta, Dripstone Elberta, J. H. Hale, Beale

Plate 6.

Grape Vineyard before Pruning—Variety Waltham Cross.

Plate 7.

Tomatoes—Typical Ground Crop in the Granite Belt.

and Smith's Seedling. Late varieties of peach are of little commercial importance owing to the absence of any strong demand for clingstone fruit suitable for canning; Golden Queen is the main representative of this group.

Apricots.

Although apricots do not thrive in the Stanthorpe district, most orchards contain a small number of trees in bearing to supply the early market. Trevatt, Moorpark and Newcastle are the most satisfactory varieties.

Grapes.

Grape growing (Plate 6) constitutes an important industry in the Granite Belt. The harvesting period is later than that in other districts and extends from the last week in January to the end of March. The area under crop is 1,950 acres. The main varieties are Muscat Hamburg, Waltham Cross and Purple Cornichon. All are grown for table purposes.

Tomatoes.

About one-third of the tomatoes (Plate 7) grown in Queensland are produced in the Granite Belt. Irrigation facilities are very limited and yields vary a great deal from year to year according to the amount of rain during the growing period and its distribution during the season. The most popular variety is Q2, one of the strains developed by the Department of Agriculture and Stock. Seed of this and other certified varieties is produced under supervision each year.

Seedbeds are established in late winter and seedlings are available for field planting between September and December for crops which will be harvested between January and April. Normally, early frosts terminate the season in May. Most of the fruit is marketed in Brisbane but small quantities may be consigned interstate.

Cabbage and Cauliflowers.

Most of the cruciferous crops are relatively hardy and successional plantings are made to ensure a long harvesting period which extends into the winter. Cabbages (Plate 8) have for long been the more important commercial crop and drum-headed types such as Succession are widely grown. They are more tolerant of stress conditions during the growing period than the ball-headed types and therefore better suited for production in areas without irrigation. The acreage under quick-maturing varieties is, however, increasing owing to the keen market demand for small, quality heads.

Cauliflowers have so far been grown only on a small scale, for until recently the standard varieties were slow-maturing types which require luxury treatment during the growing period. However, a range of quick-maturing cauliflowers with reasonably compact and small-sized heads is now available. They include Russian 2A, Snowball strains and Phenomenal 4 Months. The performance of these types in the last three years suggests the possibility of a considerable expansion in the acreage planted.

Pulse Crops.

Peas and beans are both grown on a sizeable scale in the area. Payable markets for peas are restricted to a short period in spring and it is the usual practice to establish the crop in autumn or early winter. Sowings at this time of the year may be supplemented by further plantings in August and September, depending on the market outlook for the crop in any particular year. The principal variety grown is Greenfeast.

The bean crop cannot tolerate frost and plantings do not begin until late September. From then on, successional sowings are made until December. The principal variety is Brown Beauty, which is popular on Queensland markets.

SIZE OF HOLDINGS.

Only a small percentage of fruit growers specialise in a single crop. The majority of orchards contain several varieties of apples and stone

Plate 8.

Succession Cabbage in the Granite Belt.

fruits or alternatively stone fruits and grapes. Where the apple is the main crop, the size of the orchard varies from 15 to 120 acres, the average holding being approximately 25 acres. Orchards which are mainly concerned with the production of stone fruits seldom exceed 30 acres, while the largest vineyard in the district is 30 acres.

THE FUTURE.

The fruit and vegetable industry in the Granite Belt passed through a period of relatively low prices prior to 1939. Since then, markets have improved and the demand for fruit remains good. Most orchards are now well equipped with efficient machinery for cultivating the soil, spraying the trees and grading the fruit. Orchard management shows a corresponding improvement.

One of the most significant developments has been the demonstration by the C.S.I.R.O. Research Station at Applethorpe that some Merton rootstocks increase both the size of the apple tree and its crop potential. Substantial plantings of trees on these rootstocks can therefore be expected in the next few years as young trees become available in quantity.

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The COUNTRY HOUR, a special service for farmers, is broadcast DAILY from Monday to Friday through the National and Regional Stations from 12 to 1.

Cauliflower Varieties.

By C. N. MORGAN, Senior Adviser in Horticulture.

During the last few years, there has been a marked expansion of the area planted to cauliflowers and the crop is grown in some districts where it was formerly of little importance. This development has been stimulated by relatively good prices for the early crop but would not have been possible without the use of some new varieties.

VARIETAL TRENDS.

Cauliflower varieties may be divided into three groups—early, mid-season and late. These terms refer specifically to the time when the flowers are produced rather than the time of planting.

Early varieties take up to 12 weeks from planting out to cutting, but under some conditions they mature their flowers in a shorter period. For example, when planted in January at Redlands, varieties such as Russian 2A, White Queen and Snowball may be cut in 9 to 10 weeks, but if the same varieties are planted out in late February they probably take 11-12 weeks to mature.

Mid-season types include such varieties as Phenomenal 4 Months and Hawkesbury Solid White, which grow more slowly than the early varieties and are more suited to cool winter conditions.

Late varieties, such as Phenomenal 5 Months and Phenomenal Maincrop, take 15 weeks or more to mature.

Most of the seed used in Queensland comes from southern States and descriptive terms such as "4 months" and "5 months" refer to maturing times in those areas. When the same varieties are grown here, they mature more quickly than they do in the south.

Of the main varieties available, only a few are suitable for Queensland and there may be several strains within a variety.

In the variety Phenomenal, which is well known in the State, there are four strains—12 Weeks, 4 Months, 5 Months, and Maincrop. One strain—Phenomenal 4 Months—is so adaptable that, although it is primarily an early variety, it still produces reasonably good flowers in mid-season and late-season crops.

The Snowball variety has even more strains than Phenomenal but some of these differ very little from each other and any of them may be used for early and mid-season plantings.

Varieties such as Primus, Eclipse and Autumn Giant were used in the early days of the industry in Queensland but have now gone out of favour.

At one time it was customary for many growers to import seed direct from Denmark, but the war ended this practice. In the 1940's, however, American horticulturists began to concentrate on cauliflower seed production, mainly in varieties of the Snowball type. The result was the

Plate 1.

Commercial Cauliflower Production in the Rochedale District.

development of a number of strains in which the flower types are similar in appearance but differ slightly in size or time of maturity.

One of the most interesting introductions to Queensland was a Russian variety—now named Russian 2A—which first made its appearance in the mid-1940's. It immediately became popular on account of its earliness and its ability to produce flowers of good size and quality in comparatively warm weather. This variety, perhaps more than any other, sets the standard for early plantings in coastal areas. Though not free from defects, it is an outstanding type and local selection within it may give rise to an even better strain.

MARKET REQUIREMENTS.

The market pays a premium for flowers which are moderate in size (4-6 lb. in weight) and uniformly white to light cream in colour. The texture must be fine and the curd must be well curled under towards the stem. Most of the varieties in use are capable of producing flowers of the required standard providing they are cut at the right time and the developing flower is well protected from exposure by "covering."

DESCRIPTION OF VARIETIES.

Numerous varieties have been tried at Redlands Experiment Station and elsewhere in Queensland, but the following list is restricted to those of commercial interest.

White Queen.

A good variety for early planting and grown to some extent in North Queensland, where a quick-maturing plant type is required. The plant is fairly small and the flower is round, compact and rather shallow, but quality is good. The average weight is about 4 lb.

Russian 2A.

An early variety suitable for south-eastern Queensland and of possible value at Stanthorpe and in the North.

It requires good cultural conditions, with special attention to hot water treatment of the seed to control black rot and the correction of molybdenum and boron deficiencies in the soil.

The plant is fairly upright in growth, is medium in size and grows strongly. The flower, though not deep, is well up to an acceptable market standard, firm, compact and creamy white in colour. In common with many other varieties, it does not cover its flower well at maturity and hand-covering must be practised to preserve flower quality. Average weight is about 4 lb.

Snowball.

The available strains are Snowball 60, 90, A, Early, X and Y. They are all similar in habit of growth with only slight differences in times of maturity. "A" and "60" are the quickest to mature but the former is not so consistent in the field as some other strains. Snowball X is fairly popular, but under warm conditions a small percentage of the plants may fail to produce marketable flowers. The best results have been obtained from Snowball Early.

The flowers of the Snowball variety are round, deep, compact, well turned under, snow-white in colour and of even texture. The leaves cover the flowers better than in most other types of commercial cauliflower.

Phenomenal.

The Phenomenal strains—12 Weeks, 4 Months, 5 Months, and Maincrop—comprise the bulk of the cauliflowers in Queensland, with 4 Months by far the most popular.

The field performance of the earliest strain—12 Weeks—has been inconsistent and generally inferior to that of the other three; the flower is

Plate 2.

Snowball Early. Note the compact curd with good colour and even texture.

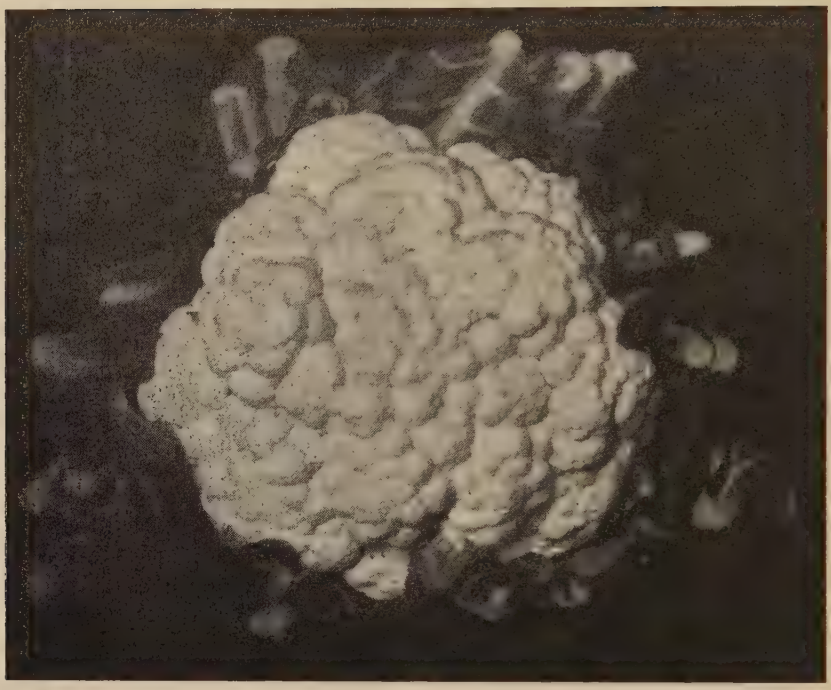

Plate 3.

Phenomenal 4 Months. A mid-season variety which is popular with Queensland growers.

very coarse in texture and open, with an unattractive curd.

The 4 Months strain, on the other hand, performs consistently well and the flower is of high quality. When hot weather extends into late autumn, quality may drop below average but this does not happen very often. The typical 4 Months plant has a semi-erect habit and its growth is vigorous. The flower is round with a rather rough but not unattractive curd of fairly fine texture and good quality. Size averages between 5 and 6 lb.

Phenomenal 5 Months and Maincrop are late-maturing strains; the plant type is similar to Phenomenal 4 Months but the flowers are generally bigger and the texture is not quite so fine.

PLANTING RECOMMENDATIONS.

Current recommendations for the more important cauliflower-producing districts are as follows:—

Districts.	Variety.	Seedbeds.	Field Planting.
Coastal areas	Russian 2A	Late December to Mid-February	Late January to March
	Phenomenal 4 Months	Mid-January to March	February to late April
	White Queen	January	February
	Snowball	January to February	February to March
Stanthorpe ..	Russian 2A	October to December	December to January
	Phenomenal 4 months	October to December	December to January

Hints on Hive Making.

By C. ROFF, Adviser in Apiculture.

In Queensland many beekeepers, both commercial and non-commercial, make their own hives and for others intending doing so the following hints should be of interest.

When constructing a hive, the first essential is to decide the size and type. The Standard Langstroth 10-frame hive is the one most generally used in Queensland and home-made hives should conform to this general pattern. By having uniform equipment the parts are interchangeable from hive to hive and manipulation of the colonies is comparatively simple. An apiary composed of standard equipment will always sell at a better price than one made up of assorted or unusual sizes.

As the finished hive must be solidly built and able to withstand rough usage, the timber used should be seasoned softwood of good quality. The corners, which must remain square, are the weak parts of the hive and should be rabbeted and then nailed on both faces (Plate 1). Cement-coated nails should be used to

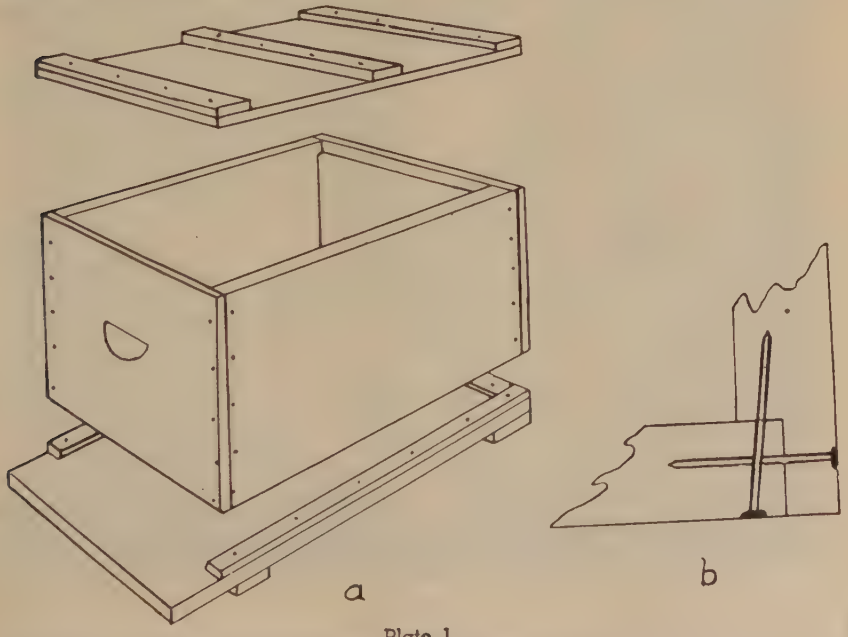

Plate 1.

Diagram of Hive. (a) Bottomboard, hivebody, and top cover; (b) Corner of hive illustrating rabbeting and method of nailing.

prevent slipping, warping, and distortion. Before assembly, rabbeted surfaces should receive a good coat of oil paint.

The hive consists of a bottomboard, hive cover and hivebody or super containing 10 movable frames. The component parts are not fastened together but are superimposed movable units (Plate 1).

The bottomboard or floor is 22 inches by 16 inches by $\frac{7}{8}$ inch thick. If an alighting board is not required the length should be reduced to 20 inches. On the upper surface, the edges should be raised on the two sides and the back end by nailing slats $\frac{7}{8}$ inch wide by $\frac{1}{4}$ inch thick. To prevent warping, two cleats 16 inches by 2 inches by $\frac{7}{8}$ inch thick should be attached across the under side of the bottomboard.

The top cover is designed to protect the hive from weather. A flush-fitting flat wooden cover, cleated on the upper side at the ends and across the centre, is the most convenient. The dimensions are 20 inches by 16 inches by $\frac{7}{8}$ inch thick. The cleats should be 16 inches by 2 inches by $\frac{7}{8}$ inch thick.

The hivebody or super is simply a bottomless wooden box which rests on the raised edges of the bottomboard. The standard dimensions of a hivebody or super made from $\frac{7}{8}$ inch timber are:—

Outside: 20 inches by 16 inches by $9\frac{1}{2}$ inches deep.

Inside: $18\frac{1}{4}$ inches by $14\frac{1}{4}$ inches by $9\frac{1}{2}$ inches deep.

If timber other than $\frac{7}{8}$ inch thick is used then all outside measurements of the hivebody, bottomboard and top cover will need to be adjusted. The inside dimensions as shown are essential for the correct fitting of the frames.

The rabbets for cornering the hivebody should be cut into the end boards and should be $\frac{7}{8}$ inch wide by 7/16 inch deep, to receive the ends of the sides. The length of the side timber will be 20 inches less the depth of the two 7/16 inch rabbets—that is, $19\frac{1}{8}$ inches. Before the hivebody is assembled a rabbet, 7/16 inch wide by $\frac{1}{2}$ inch deep, should be cut into the inner top edge of each end board for supporting the frames. If metal rabbets are to be fitted, then the timber rabbet should be $\frac{3}{4}$ inch deep instead of $\frac{1}{2}$ inch. A shallow slot or finger-grip should be cut or chiselled into the face of each end board, slightly above centre.

After the hive has been completed two or three coats of paint should be applied externally, the sawn edges receiving particular attention. The paint weatherproofs the hive, which, if repainted about every two or three years, will last indefinitely. Furthermore, hive temperatures are lower if white or very light-coloured paints are used.

Home-made frames are not recommended as the factory machined frames are accurately constructed and usually cheaper. Self-spacing frames are the most useful.

RENEW YOUR JOURNAL SUBSCRIPTION EARLY.

Journal subscribers are requested to renew their Journal subscriptions well in advance of the month of expiry, as it is often difficult to provide missing numbers.

The Honey Flora of South-eastern Queensland.

By S. T. BLAKE (Botanist) and C. ROFF (Adviser in Apiculture).

(*Continued from page 342 of the December issue.*)

Rough-barked Apple.

Botanical Name.—Angophora intermedia DC.

Other Common Names.—Apple, Apple-tree.

Distinguishing Features.—A tree with grey, flaky, brittle bark, narrow, pointed leaves arranged in pairs, and bunches of short-stalked, white flowers with numerous stamens and shorter semicircular petals (Plates 104-106).

Description.—This is a tree up to 50 ft. high, usually with a short trunk and often a spreading crown. The bark is grey, flaky, and fairly soft and brittle. The leaves are borne in pairs along the slender twigs; they are narrow, pointed, paler underneath, about 3-4½ in. long and ½-⅝ in. wide, about 4-7 times as long as wide. The flowers are arranged in large bristly bunches at the ends of the twigs and have stalks up to about ¼ in. long; they are white, about ¾ in.

Plate 104.

Rough-barked Apple (Angophora intermedia). Leaves and seed-capsules.

wide, with five small tooth-like sepals, five semicircular petals and numerous longer stamens. The seed-capsules are cup-shaped, with thin, ribbed walls, from $\frac{3}{8}$ in. to nearly $\frac{1}{2}$ in. long and wide.

Distribution.—Rough-barked apple is found chiefly along creek banks and on alluvial flats in the Darling Downs and Burnett Districts, as well as in the Maranoa, Warrego, Leichhardt and Port Curtis Districts and eastern New South Wales.

Usual Flowering Time.—December-January.

Colour of Honey.—Dark amber.

Importance as Source of Honey.—Medium.

Importance as Source of Pollen.—Major.

General Remarks.—This species is the most important of the *Angophora* group, which characteristically blossom best in the drier years. In a good season some 60 lb. of this honey may be obtained by each colony from this source.

The dense honey, which tends to darken natural blends, has a strong flavour, is not popular for table purposes and accordingly is often left in the apiary for winter stores. It granulates with a coarse grain except in blends with fine grain honeys.

Large quantities of pollen are obtained from rough-barked apple and it is not unusual to find all available cells in the brood-combs filled with this bee-food.

Plate 105.

Rough-barked Apple (Angophora intermedia). Portion of trunk. Graysholme.

Plate 106.

Rough-barked Apple (Angophora intermedia). Graysholme.

Wood's Apple.

Botanical Name.—*Angophora woodsiana* F. M. Bail.

Other Common Name.—Apple-tree bloodwood.

Other Botanical Name.—*Angophora intermedia* DC. var. *woodsiana* (F. M. Bail.) F. M. Bail.

Distinguishing Features.—A tree with grey, flaky, somewhat brittle bark, leaves arranged in pairs on distinct stalks, and bunches of long-stalked white flowers with numerous stamens and shorter semicircular petals. It is very like rough-barked apple, but is usually less spreading, and has somewhat larger leaves and flowers on quite long stalks (Plates 107-109).

Description.—This is a tree up to 40 ft. high with grey, somewhat brittle, flaky bark, scaly on small branches. The leaves are borne in pairs along the slender twigs; they are pointed, paler underneath, 4-7 in. long, $\frac{1}{2}$-$1\frac{1}{2}$ in. wide, and $3\frac{1}{2}$-6 times as long as wide. The flowers are arranged in large bristly bunches at the ends of the twigs and have stalks $\frac{3}{8}$-$1\frac{1}{4}$ in. long; they are white, about $\frac{3}{4}$ in. wide, with five small,

Plate 107.

Wood's Apple (Angophora woodsiana). Leaves and seed-capsules.

Plate 108.

Wood's Apple (Angophora woodsiana). Portion of trunk.

tooth-like sepals, five semicircular petals, and numerous longer stamens. The seed-capsules are nearly box-like, with five prominent ribs and thin walls between, about ¾ in. long and wide.

Distribution.—This tree seems to be restricted to the Moreton District, where it occurs in forest country on sandstone or deep sandy soils.

Usual Flowering Time.—December-January.

Colour of Honey.—Dark amber.

Importance as Source of Honey.—Minor.

Importance as Source of Pollen.—Major.

General Remarks.—Those for the broad-leaved apple apply equally well to this species.

Plate 109.

Wood's Apple (Angophora woodsiana). Inala.

[TO BE CONTINUED].

QUEENSLAND BUSH BOOK CLUB.

The Queensland Bush Book Club feels that there are still many country people who do not know of the service the Club gives to those living beyond the reach of town libraries.

For a fee of 3s. 6d. a year, subscribers may receive parcels of 10 books as well as magazines and illustrated papers. The Queensland Railway Department carries the parcels free to the nearest railway station, but members must make their own arrangements for delivery from the station.

Each parcel contains about three months' reading, but exchanges may be made more often if desired. Write to the Secretary, Bush Book Club, Victory Chambers, 249 Adelaide street, Brisbane, enclosing 3s. 6d. and you will be enrolled as a member.

Body Lice in Sheep.

By S. J. MILLER, Senior Sheep Husbandry Officer.

The wool that hangs on fences and trees is one dead loss that can be charged to body lice. They cause other serious losses, too.

Sheep irritated by lice won't feed contentedly and so they grow less wool. The fleece has a ragged appearance, with tags of wool showing above the normal fleece surface. Often the fleeces are cotted, and the wool is nearly always stained. Rubbing against fences and trees causes a slackness and allows dirt to get into the wool.

Sometimes the irritation may be so severe that the whole fleece is shed as a result of inflammation of the skin and feverishness. If this does not happen, the fleece will undoubtedly become tender. It has been claimed, too, that lousy sheep are more likely to suffer from body strike.

Altogether, then, body lice can take a lot of the profit from a sheep.

Lice have spread rapidly during the last ten years. This does not mean that methods to eradicate them are worthless. Maybe a more determined and planned attack on the problem is necessary. In the early forties, Dr. F. H. S. Roberts mapped the incidence of lice as in Plate 1. Today, however, some lice can be found in every sheep area in Queensland. Some of the causes for this spread are:—

(*a*) Droughts;

(*b*) Labour shortages;

(*c*) Faulty dipping;

(*d*) Higher wool values.

Perhaps a major cause of the spread is that woolgrowers have done little to check it. A few lousy sheep or a few lice on sheep did not cause much of a loss at the time. Because nothing was done to check the lice, their numbers increased. A few visiting sheep from next door, being sociable, took a few lice home and so it went. Once a flock became very lousy something was done about it. However, this delayed action did not tend to check the spread of lice.

During the 1948 and 1952 droughts, many sheep were taken south and east for agistment. When conditions improved they were returned, often "complete with lice". Many known infested flocks were dipped prior to returning, but in many cases the length of wool made it difficult to kill the lice.

When these sheep arrived home the lice established themselves. As lice were something new, no dips were available; shortage of labour and materials did not improve the position. As well as the delay in getting

Plate 1.

Distribution of Body Lice 15 Years Ago. Lice now occur in all sheep areas.

dips built, this also meant that fences were not often sheep proof. Mustering was not 100% efficient, and one undipped lousy sheep can re-infest the flock.

Faulty dipping also helped the lice to become established and to spread. Dipping is a skilled practice—especially if eradication is the aim. When lice are new to a district, dipping is a new skill to be learned. Inexperience, especially with newer insecticides which tend to "strip", has played its part in the establishment of lice in new areas.

Sheep movement in Queensland has usually been from the north-west to the south-east and from the west to the east. With a rising market after the war, sheep dealing was a profitable

business. Sheep were taken east to west and south to north. Lack of care on the part of the woolgrower in moving his sheep has no doubt helped the spread of lice.

How Do Lice Numbers Increase?

The heaviest lice infestation on the sheep usually occurs along the back and down the sides. The belly wool is seldom affected, but on occasions heavy infestation can be found on the underside of the neck. Individual sheep differ considerably in their attractiveness to lice. Sheep in poor condition are usually more attractive. These sheep tend to carry a heavy lice population through the year, but generally there is a marked seasonal variation in the lice population, the heaviest being carried from June to September.

The unshorn sheep offers a more suitable home for lice than shorn sheep.

The sheep louse spends the whole of its life on the sheep. Whether eggs hatch or not depends largely on temperature and humidity. These hazards are not as great as they are for the eggs of other parasites. This is due to the fact that the eggs are laid on the sheep and protected from any sudden changes by the wool.

The eggs take about 9 or 10 days to hatch. Young lice are ready to breed 24 days after hatching. The life cycle takes 34 days from egg to egg. The female louse lays about 2 eggs every 3 days.

The adult lice are very active in the wool but rarely leave the sheep except to transfer to another sheep. This they can do very rapidly when sheep are in contact with one another. A few infested sheep can rapidly infest a whole flock. Lice can live for 5 or 6 days off a sheep under ideal conditions. Because lice and their eggs are affected by changes in temperature and humidity, it is not thought that yards and camps are an important source of infestation. However, during the cooler months, shearing sheds which house lousy sheep may be.

How Can You Control Lice in Your Flock?

Once the habits of lice are known, control measures can be adopted. When a parasite spends the whole of its life on an animal, eradication can be successful. It is easy provided you have a plan.

To get eradication or even adequate control—

1. Dipping must be thorough;
2. Musters must be clean;
3. All sheep must be treated about the same time;
4. Fences must be sheep proof.

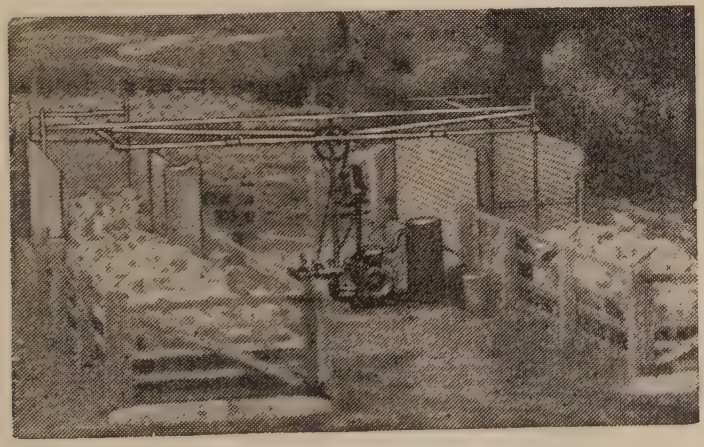

Plate 2.

Double Race Spray Dip.

[Photo by courtesy of Sunbeam Corporation.

A lice control programme must be based on dipping, paddock management and sound fencing.

Dipping, as a management practice, must be carried out to fit in with such things as mating, shearing, lambing, &c.

The usual practice is a shearing or crutching prior to joining or lambing. Dipping to be effective must be carried out soon after shearing. To get good results a lot of planning is necessary. Such things as musterings, clean paddocks to put sheep into, order of dipping sheep, and Mulesing weaners have to be considered. In mulga country where mustering is a problem you will probably decide to dip straight off shears.

As a paddock is cleared for shearing, stragglers must be picked up and the paddock spelled for about a week before dipped sheep are put back into it. If the back paddocks are mustered prior to shearing and the sheep brought closer to the shed, then it is easier to manage things so that all paddocks get a week's spell prior to returning dipped sheep to them.

If joining takes place after dipping it may be easier to box different mobs after shearing to ensure they go into a spelled paddock. A few spelled paddocks are easier to get than a lot. The ewes can be drafted up for joining. In this case rams should be dipped first—sometimes before the others. They should be kept away from the other sheep till dipping is completed. If Mulesing is done at the same time, the weaners should be kept separate till they have been dipped.

The dip should be checked well in advance of dipping. The amount of fluid needed should be calculated and ordered to arrive in time.

Since lice infestation is a scheduled disease in Queensland, it may be necessary to dip sheep irrespective of the length of fleece. However, dipping shortly after shearing gives a better "kill" and does not cause an unsightly stain in the wool, and a shorn sheep is much easier to wet. Shearing reduces the body lice population and also exposes the eggs on the skin to variations in temperature and humidity. This prevents many eggs from hatching. Four to six weeks "off shears" (that is, after cuts have healed) is the usual time of dipping. If arsenic is used before this time lapse, insufficient to kill lice on hatching may be retained by the fleece. Serious losses caused by absorption of arsenic through shear cuts can follow.

Insecticides, such as DDT and BHC, have been used "off shears" but neither of these has a disinfectant added. Cases of lameness after the use of BHC dips have been recorded in Australia. This dip can be made safer to use off shears by the addition of 1 lb. of copper sulphate (bluestone) to 500 gall. of dipping fluid. Phenol solution can also be used.

Dipping fluids can be classified roughly according to the way they act. There are:—

1. Repellents;
2. Stomach poisons which are infested;
3. Contact insecticides which kill by contact.

As lice live on skin debris and not blood, either a contact insecticide or one that acts as a poison, when ingested, can be used. The dipping fluid must come in contact with the lice or its food. The efficiency of any of them depends partly on the product itself, partly on how it is made, and largely on how it is used. More often than not the fault lies with the dipping method and not the dipping fluid. It is imperative that the maker's instructions are followed rigidly.

As lice breed only on the sheep, a dipping fluid that will kill lice and kill the young lice which hatch at a later date is required. Arsenic, DDT and BHC all remain in the fleece for 3 to 4 weeks. If one isolated sheep is dipped thoroughly in any of these preparations, the lice are killed. This

being so, why can't lice be easily eradicated from a flock?

Of the dips that have been used, arsenic, BHC and DDT are the most popular. Each has its virtues and each its faults.

Arsenic.

There is a tendency for old drugs to fall into disrepute when new ones are discovered. We have seen sulpha drugs displaced by penicillin and this by chloromycetin. However, sulpha drugs still play an important role in human and animal medicine.

The efficiency of arsenic should not be underestimated. Used carefully it is as good as any other dip for beating lice. It is also the cheapest.

Arsenic poisons the lice through the food they eat. To be effective the food material of the lice must be wetted with arsenic. As they feed close to the skin, thorough wetting is essential. The residual effect of arsenic is sufficient to kill young lice on hatching, provided it is not washed out by rain soon after dipping. The main fault of arsenic is that it can be absorbed by sheep under certain conditions with fatal results. Most of these losses occur when sheep are dipped in humid weather or when the fleece is longer than one inch. This delays the drying of sheep and gives more time for arsenic to be absorbed.

Precautions with Arsenic.

Arsenic is a poison for sheep as well as lice. Normally, though, an 0.2% arsenic dipping fluid will kill lice without harming the sheep. Arsenic can be absorbed through cuts in the skin and even the unbroken skin under certain conditions. Less arsenic is required to cause fatal results when absorbed than when swallowed. Skin absorption can cause death, a shed fleece or a break in the wool. Careful dipping can prevent these losses. The "dos" and "don'ts" of using arsenic can be summarised:—

1. The best time to dip is six weeks off shears. All shear cuts will have healed by then and there will be enough wool to hold the dip.
2. Prepare the dipping fluid strictly according to the maker's direction.
3. Choose a warm sunny day to dip. Cloudy humid days are the ones when excessive skin absorption takes place.
4. Dip early in the morning. The sheep will then be able to dry before night.
5. Don't dip hot or thirsty sheep. The skin blood vessels of hot sheep are dilated and too much arsenic may be absorbed.
6. Have the sheep yarded long enough to let them cool off before dipping.
7. Don't drive sheep after dipping. This also causes the skin blood vessels to dilate.
8. Don't crowd sheep after dipping. They won't dry out and above all they may become heated.
9. Don't dip long-woolled sheep in arsenic. They won't dry quickly and skin absorption may be high.
10. Don't dip in very cold weather—drying is slow. Some losses due to hypocalcaemia may occur.
11. Don't dip ewes and lambs together. Keep them apart for some time after dipping.
12. Don't dip rams within 3 months of joining. Arsenic can lower their fertility for 9 weeks.

DDT.

DDT, a contact insecticide, has been used widely as a fly repellent. Provided the wool is well wet the lice will come in contact with the dipping fluid. However, very few experiments have been carried out using DDT to control lice. What have been done showed that complete eradication could be achieved by thoroughly wetting the sheep with a 0.2% solution of DDT. This was done using a spray dip and short-woolled sheep.

BHC.

BHC (Gammexane and similar materials) has perhaps been the widest

used of the new dips. It is easy to mix, relatively cheap and safe to use. It also is a contact insecticide. BHC dipping fluids remain in the fleece for long periods, as they are absorbed by the wool fat. They are not easily washed out by rain. Because of this they also tend to "strip" if the run-off is re-used. Every time dip is put on the sheep some of the active principle is absorbed by the yolk. The run-off returning to the sump becomes weaker as dipping progresses. Very soon the strength of the dip in the sump falls considerably. This can be overcome by repeatedly topping up the sump with more dip concentrate. This should be done after every 200 sheep or after 100 gallons have been used. In doing this the maker's instructions should always be followed rigidly.

Dieldrin and Aldrin.

Both these new insecticides will kill lice even when used at very low concentrations. They will also last in the wool long enough to kill young lice on hatching. However, a lot of work has yet to be done on the method of applying these to sheep for lice control.

These chemicals "strip" considerably. If they are to be used through a spray dip or in a plunge dip it will be necessary to know exactly how much they do "strip". At present this is not known and no recommended topping up rate is available. This is the only thing against the use of these new insecticides for lice control. No doubt in the near future they will be used extensively.

Several efficient dipping fluids are available today. If your lice control programme is not giving satisfactory results, the fault may be in the dipping procedure.

Sheep Dips.

Two types of dips are in use in Queensland. They are the power spray and the plunge dip.

Power Spray Plants.

During recent years spray dips have increased in popularity in Queensland. These are circular, square or in race form, enclosed by galvanised iron. The dipping fluid is applied from jets in a system of pipes so that the sheep is wet thoroughly after 3-5 minutes in the spray. The bottom sprays on the floor are usually fixed in position whilst the top sprays revolve. This top movement causes the sheep to move whilst in the dip. The bottom sprays only are used at the start and the top sprays only after about 2 minutes. This gives greater pressure. If after 1-2 minutes under the top sprays the exit door is opened while the sprays are still operating, emptying of the dip enclosure is facilitated.

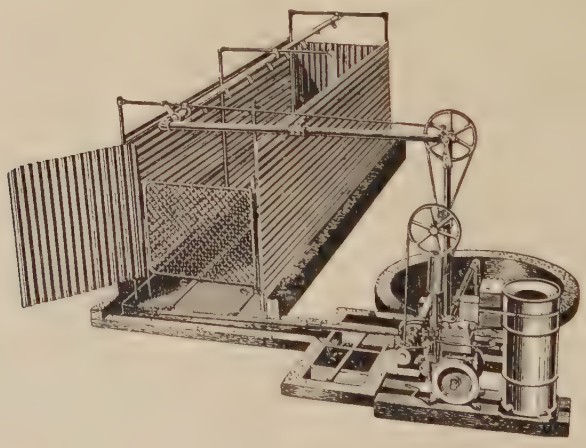

Plate 3.
Single Race Spray Dip.
[Illustration by courtesy of Sunbeam Corporation.

Plate 4.

Spray Dip. Note upper and lower nozzles.
[Photo. by courtesy of "Queensland Country Life."

Entrance.

It is much easier to fill these dips than to get sheep into a plunge dip. The operation is made easier if the dip is in a shaded spot, as shadows cause the sheep to baulk. In some types of spray dips the run-off is taken out of the side to the sump. This should be shaded or covered, as it is often difficult to get sheep to file into this section of the dip.

Draining Pens.

Draining pens are essential to avoid waste. Two pens are better than one. Whilst sheep in one are draining the other can be used to receive the new mob. Concrete or battens over

galvanised iron can be used. Strainers over the sump are supplied with these plants and should be used to prevent the sump filling with dirt and droppings.

Spray dips have advantages over plunge dips in that:—

1. Less labour is required.
2. They are more economical with dipping solution, especially where small flocks are concerned.
3. They can be used to tip spray sheep for fly control—the main advantage with them is that full-woolled sheep can be given a light tip spray without damage to the fleece.

The amount of fluid used can be regulated by the time sheep are kept in the dip. The success of this form of dipping still depends on thorough wetting of the sheep. It is essential that the nozzles are kept free and the job is not rushed. Sheep should be treated soon after shearing.

Constructional details and instructions for installation of these dips can be obtained from the manufacturers.

Plunge Dips.

The plunge sheep dip consists of a long narrow swimming bath about 2 ft. wide and 5 ft. deep. At the entrance are the forcing yards and slide, and at the exit the concrete draining pens. The dip should be long enough to ensure that sheep will remain in the bath long enough to be wet thoroughly. Plunge dips can be made of wood, steel, brick, or reinforced concrete. Concrete may be a disadvantage in black soils which tend to swell excessively.

Entrance.

Various designs and schemes have been tried to outwit the sheep and make dipping an easier operation. However, no set rules can be given as to which is the best approach. Once a sheep has been dipped, a repetition of the process will always be more difficult.

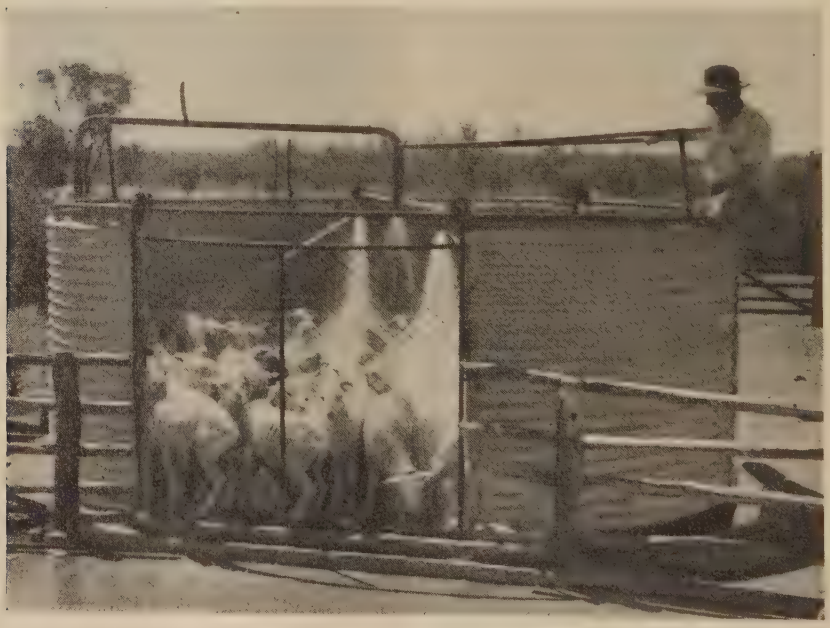

Plate 5.

Circular Spray Dip.

[Photo. by courtesy of "Queensland Country Life."

Plate 6.

Plunge Dip. Note the splash trays and straight-ahead entrance. The raised jetting race on the right is another worthwhile feature.

[Photo. by courtesy of "Queensland Country Life."

A straight slip-in entrance is favoured by many and others favour a side slip entrance. In this form the entrance is elevated and to the side of the dip. The sheep walk to a dead end, often attracted by decoy sheep. By the time these decoys are reached the sheep is on the slip and must fall in. A piece of bag is often hung between the dip and the slip entrance.

Plate 7.

Side Slip Entrance. Note curved race and decoy pen.

Plate 8.

Side Slip Entrance. Note sloping floor and screen.

The dip may also be built at the end of the shearing shed, and use made of the shed instead of the forcing yards to bring the sheep to the dip.

Whatever entrance is used, it is essential that the approach be covered with grating. If this is not done a considerable amount of dirt will be carried into the dip.

Draining Pens.

Draining pens are essential to avoid waste. Two pens are preferable, as one can be used while sheep are draining in the other. Concrete or battens over galvanised iron can be used. It is preferable to have the run-off drain into the dip near the entrance and not the exit. If it is at the exit, which is usual, a scum forms at this end of the dip. When the sheep swims through this scum a considerable amount of it is carried out on the fleece, causing damage to the wool. All run-off should be strained or run through a sump before running back into the dip.

Organising Dipping.

When organising the dipping remember the best of plans can be upset by wet weather. So have an alternative. The "dos" and "don'ts" of dipping are:—

"Dos."

1. Have your programme organised in advance.
2. Dip all sheep on the property at the one time. One missed lousy sheep can re-infest a flock.
3. Keep the dipped ones away from the others if all can't be treated at the one time.
4. Dip soon after shearing. Both spray and plunge dips lose their effectiveness once the sheep have more than 6 weeks' wool.
5. When mixing the dip follow the maker's instructions.
6. Keep the dip at the right strength, especially if the newer dips are used. Top up frequently to overcome "stripping".
7. Clean the dip or sump before and after use.
8. Dip early in the day.
9. Yard sheep in time to let them cool off before dipping.

"Don'ts."

1. Don't rush the job.
2. Don't dip during cold or wet weather.
3. Don't dip thirsty sheep.
4. Don't dip on overcast, hot, humid days.
5. Don't crowd sheep after dipping.
6. Don't drive or overheat sheep after dipping.
7. Don't wait till signs of lice are obvious before dipping. By then the sheep will have too much wool.
8. Don't dip ewes and lambs together.
9. Don't dip rams in arsenic prior to joining.
10. Don't forget the "killers" and "poddies".

Trees on Roads.

SUPPLIED BY THE QUEENSLAND FOREST SERVICE.

There appears to be a misapprehension in the minds of some landholders as to the position concerning damage to or destruction of trees on roads adjacent to their properties.

The Legal Position.

It is an offence under "*The Land Acts,* 1910 *to* 1953," to cut, get or remove any timber from a road without a permit from the Land Commissioner or Forest Officer, the offender being liable to a penalty not exceeding £50 nor less than £5.

It is also an offence under the Land Acts *to clear or ringbark* trees on a road without a permit from the Land Commissioner or Forest Officer, the offender being liable to a penalty not exceeding £20 and, in addition, to a penalty of not less than one shilling and not more than ten shillings for every tree cut down, destroyed or ringbarked by him.

The consent of the Local Authority must also be obtained, but this in itself is insufficient and the landholders must in all cases also apply to the Land Commissioner or Forest Officer, and secure his permission before commencing operations.

On Main Roads, the timber is under the control of the Main Roads Commissioner.

The Value of Trees on Roads.

Trees on roads have many values—

(1) They provide shade for travellers, both man and beast.

(2) They inspire a love of beauty and they improve the scenic aspect. It is undeniable that tree-lined or tree-dotted roads are more pleasing to the eye than roads which are completely bare. The scenic aspect has a practical economic value, since visitors will return to beautiful areas and will avoid ugly places.

(3) They are an important reserve source of timber supply. Trees growing on roads often yield piles and girders for bridges, logs for sawing, fence posts, poles for farm buildings, &c.

(4) They furnish windbreaks. It is recognised that cultivations open to prevailing winds do not yield as well as those which are protected. Blowing away of top soil also has a deleterious effect on property. Farmers, in seeking to destroy trees, are inclined to forget these facts because it is more obvious that crops in the immediate vicinity of road trees are affected by root competition.

(5) Trees on roads or hillsides can act as brakes on water erosion and can minimise damage to both roads and properties by heavy rain.

(6) Trees provide a source of honey supply.

(7) They are the nesting places of insect-eating native birds—allies of the farmer.

(8) Trees often possess scientific or other values.

(9) Their leaves may be of value for stock fodder or other purposes.

Why Destroy Trees on Roads?

The main reasons put forward by persons wishing to destroy trees on roads are—

(*a*) They interfere with adjacent vegetation;

(*b*) They are a danger to nearby improvements.

It is recognised that trees sometimes affect crops, grass, &c., growing nearby, but in this regard the overall advantages and disadvantages must be taken into consideration.

The Department's view is that if permission were granted to cut down trees because of interference with vegetation on adjacent lands there would be no justification for withholding permission for complete denudation on all roads; therefore, landholders are advised that this plea cannot be accepted in itself as a reason for permitting destruction of timber.

Where a landholder desires to destroy trees on roads on the grounds that such are dangerous to his improvements, the reasons for stating that such trees are dangerous must be furnished. In this regard the size, direction of lean, and general health of the tree are important, as well as the location and nature of the improvements considered to be threatened. It is pointed out that it is usually open to the landholder to erect structures where trees on roads do not overhang, and that in many cases trees are a protection against wind damage to buildings.

If destruction of trees is desired for any other reason, such must be fully stated.

Caution!

The Forestry Department has issued instructions to officers that all cases of unauthorised cutting, clearing or ringbarking of timber on roads must be investigated with a view to taking proceedings against offenders.

ANIMAL HEALTH

Traumatic Pericarditis: Inflammation of the Heart Sac Caused by Physical Injury.

By W. R. RAMSAY, Assistant Veterinary Officer.

Inflammation of the sac in which the heart lies, caused by a sharp foreign body, occurs most commonly in ruminants such as cattle and goats. This is because it is fairly easy for a nail or a piece of wire to pierce the honeycomb (the reticulum or second stomach) and pass into the diaphragm.

When a nail or similar object is swallowed, it passes through the paunch into the honeycomb. Here, because of its weight, it lodges in the folds of this organ, which is easily penetrated by a sharp object.

Once the object has penetrated the honeycomb it may take one of several courses, and various organs have been affected. In nearly half the cases of injury to body organs due to sharp objects making their way through the honeycomb, the heart has become involved. In this course, the object works through the diaphragm, aided by the rhythmic movements of the diaphragm, and is then very close to the heart sac, penetration of which is assisted by the regular pulsations of the heart.

The foreign body in its wanderings sets up a great deal of inflammation in the tissues surrounding its track. Bacteria, too, penetrate with the object, and although septicaemia (blood poisoning) is uncommon the bacteria from the honeycomb produce sufficient tissue damage to keep the track of the foreign body partly open, or filled with pus and surrounded with black tissue. By careful dissection on post-mortem it is often possible to find even a small foreign body at the end of this track or sinus.

Causes.

Sharp pointed objects may be swallowed accidentally with supplementary food (for example, baling wire in lucerne hay). Cows which have a depraved appetite and chew bones and lick metallic objects may also swallow sharp objects. Depraved appetite is very often a sign of phosphate deficiency and should be checked by a blood test. The deficiency can be cured by feeding bonemeal in the ration (for information on how to do this, see your local stock inspector or veterinary officer).

Symptoms.

The symptoms of traumatic pericarditis usually do not appear as soon as the foreign body is swallowed. The object may be in the honeycomb for some time. Perforation is hastened by such things as long rail journeys, hard driving, advanced pregnancy, parturition and repeated copulation (especially in bulls).

The first noticeable symptoms are those of gastric disturbance. Slight bloating, cessation of ruminal movements and abdominal pain might be evident. The animal may grunt when she gets up and moves off or when pressure is applied under the ribs low on the right side. Constipation and a hunched attitude when standing might also be seen.

These symptoms, associated as they are with perforation of the honeycomb, may be slight or transitory, and the subsequent course of the disease may be unnoticed. A sharp punch on the mid-line between the floating ribs or steady upward pressure just behind the ribs by a pole passed under the abdomen will frequently elicit a grunt of pain. Pressure on the wither will also cause a cringing action, but as this is shown in some normal animals it is not altogether reliable. In skilled hands the examination of stained blood films is extremely valuable as a guide to the necessity for operation.

The animal affected may have a poor or capricious appetite and a harsh, stary coat. It may have intermittent bouts of fever, and gradually get poorer and poorer.

When the heart is affected symptoms of this are usually seen. They may be doughy swellings of the eyelids, throat and brisket, sometimes very large in the brisket. The jugular pulse may be marked. The animal may be able to walk only a few steps before the visible membranes become blue and she has to stop for breath. Emaciation and death soon follow the signs. Sudden death with symptoms of acute blood poisoning are shown occasionally.

If the animal is opened for a post-mortem examination, the inflammatory changes around the track of the foreign body are the chief damage noted. The heart in particular is found to be surrounded with white friable clots of fibrin filling the heart sac. The term "shaggy heart" gives a good description of this organ, coated as it is with these white stringy fibrin clots to a depth of half an inch. The heart sac usually adheres closely to the clots. The walls of the sac, instead of being smooth and glossy, are rough and uneven. The heart muscle is pale and often thin. The lungs are usually involved in a purulent gangrenous pneumonia, whole lobes being discoloured black or grey, and the chest cavity is filled with a dark, evil-smelling fluid. The foreign body is sometimes found within the ventricles of the heart but death from haemorrhage is extremely rare.

Treatment.

In the early stages a non-griping purge, such as paraffin oil or linseed oil (not boiled linseed oil), may be administered. No time should be lost in calling your nearest veterinarian, who will treat the animal further and operate, if necessary, to remove the foreign body.

The possibility that phosphate deficiency is the underlying cause should also be investigated.

COUNTRY BREAKFAST SESSIONS.

The Rural Broadcasts Section of the A.B.C. is now providing regular breakfast sessions of interest to rural people from 4QY, 4AT, 4QB, 4GM and 4QS, Monday to Friday from 7 to 7.15.

Peter Barr, stationed at Cairns, handles the northern programme, and Harry Greaves conducts the southern programme from Toowoomba.

Dairy Buildings on the Atherton Tableland.

By A. J. W. MURRAY, Senior Dairy Adviser.

The dairying areas of the Atherton Tableland experience a rather wet climate, as the annual rainfall varies from 80 inches in some parts to almost 200 inches on the eastern fringe. This high rainfall is accompanied by driving mist and fog, especially during the winter months. Farmers through necessity have erected their milking sheds to keep out the wet, and in many instances have provided large draining sheds where herds are enclosed immediately prior to milking.

The old-type milking shed with covered yard, as shown in Plate 1, provided little else than a dry place to milk the herd. Very little emphasis was placed on the layout of the building to include more natural lighting and ventilation. The nature of many of the covered yards with their low roofs and earth floors does not allow hygiene of a high standard to be practised in this type of milking shed.

Plate 1.

Old-type Milking Shed with Covered Yard. The whole herd is housed under this shed prior to milking.

Draining Shed Design.

It is only during the past two years that supplies of roofing iron and cement have been obtainable in sufficient quantities to enable many of the old milking sheds on the Atherton Tableland to be replaced. New combined dairy buildings are now being constructed, and for farmers in the heavier rainfall areas who require it the writer has designed a satisfactory type of draining shed to be incorporated in the plan of the milking shed. This addition not only provides dry cover for the herd, but also allows good ventilation and natural lighting. The floors of these covered yards are concreted and well drained.

The covered yard in the improved design takes the form of a gable type roof which is built at right angles to the main shed structure, thus forming an L-shaped building (Plate 2). This design enables the yard roof to be erected at the required height of at least 7 feet between the top plate and floor level, and being of the gable type it allows free circulation of air. One wall may be provided at the side of the covered yard in order to afford protection from the prevailing winds and rain. It will be noticed that the covered yard is only as wide as the bails.

Windows and glass louvres which may be opened during fine weather and closed tightly when the Tableland is experiencing weeks of wind, rain and drizzle are now included in the design of the new milking sheds (Plate 3).

There are other dairying localities in Queensland where similar conditions are experienced for long periods during the year, and although the rainfall may not be as high as on the Atherton Tableland, milking sheds of this design would afford more protection from the weather and provide more comfort for both the farmer and his herd during milking.

Plate 2.

New-type Milking Shed with Covered Yard. Note the large gable roof over the concrete holding yard.

It has been found by experience that well built, comfortable dairy buildings give the farmer more incentive to spend those extra few minutes in the milking shed so necessary for efficient cleansing of milking plant and premises after milking.

Plate 3.

This Milking Shed has Glass Louvres and Plenty of Window Space for Light and Ventilation.

General specifications of the new milking sheds being built adhere to the approved Departmental plans for Combined Dairy Buildings, except that the wall enclosing the ceiled separator room is eliminated, and instead a wall is placed across the cream storage section to provide an isolated cream room 6 ft. x 6 ft. This room is also lined and ceiled and is provided with 9 in. wide ventilations top and bottom on both outside walls. The ventilations are covered with ½ in. mesh galvanised wire netting. A 4 in. deep water pit is provided in which to stand cans of cream, or, if the farmer desires, he may provide a raised platform in the pit on which cans may be placed to keep them out of the water. The latter is of particular value where the local water supply has a tendency to corrode or rust cans. The reason for this pit and/or raised platform in the pit is to prevent ants, cockroaches and rodents entering the cream. A can cover prevents cockroaches, etc., entering—but not ants.

A concrete curbing 4 in. wide and at least 6 in. above floor level, to which the wooden ground plates are bolted, is provided all around the building, except in the doorways and in front of the bails. This practice enables the walls to be kept off floor level and away from excess water. It is recommended that these concrete curbings be entrenched in the ground to a depth of 24 in. or down to rock. Partitions are mounted on concrete bases, while posts in the bails rest on 9 in. high concrete blocks, through which pieces of angle iron protrude, so that posts may be bolted in place.

Dummy bails are suspended from the roof structure, and the cleansing of the bails is thus facilitated. Concrete floors are sloped with a gradient of 1 in. in 5 ft. across the bails, and 1 in. in 10 ft. lengthways. A 30 ft. stock-free area is an important feature in the design of the new dairy buildings. A 4 ft. wide race at the exit from the bails is optional, but a concrete apron at least 4 ft. wide should always be provided.

A holding yard at the side, with a gate at the end of the shed, is also optional. It is very satisfactory where the steep contour of the area does not allow a holding yard to be erected in the usual position. Owing to the

steep nature of many farms on the Atherton Tableland it has been necessary to lay out some new buildings and yards on this design (Plate 4).

A foot-bath through which it is necessary for the herd to wade before entering the covered yard or milking shed has proved a successful means

Plate 4.
Milking Shed with Holding Yard at the Side.

Plate 5.
Foot-bath at Entrance to Covered Yard. The bath is 10 in. deep and has a capacity of about 450 gallons of water.

of preventing cows from carrying mud into the milking shed. There are various designs and sizes of foot-baths in use. Plate 5 shows a foot-bath 10 in. deep with a capacity of approximately 450 gallons of water. Sixty cows pass through this pit twice daily. The bath is drained and refilled every four days. Ten bags of cement were used in its construction.

A Jaggan Milking Shed.

A very well built and well appointed milking shed (Plates 6 and 7) has recently been constructed by Messrs. Stephenson Bros., of Jaggan. The building, containing six milking units, has been erected to the plan of a Combined Dairy Building previously outlined. The airspace has been made 10 ft. wide so that benches and

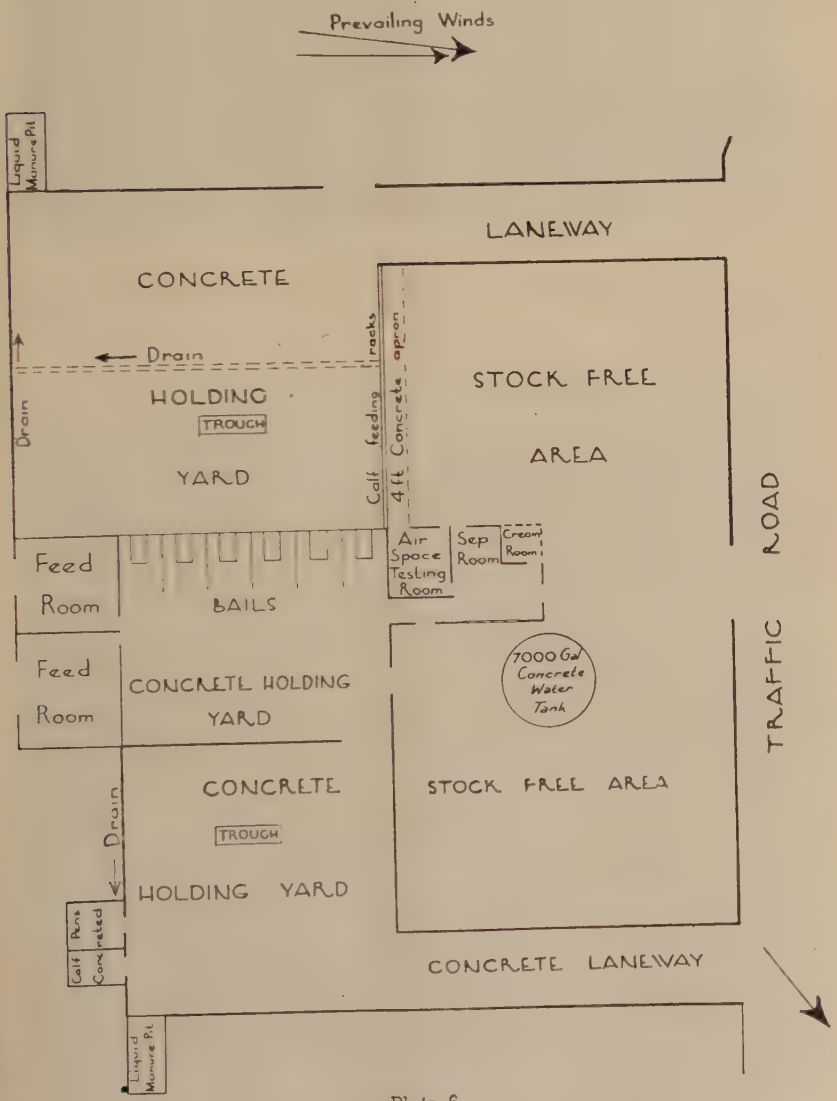

Plate 6.

Ground Plan of Messrs. Stephenson Bros. Milking Shed at Jaggan.

Plate 7.

Messrs. Stephenson Bros. Milking Shed. Note the feed room wing at the far end of the shed, also the 7,000 gallon water tank and the concrete laneway in the foreground.

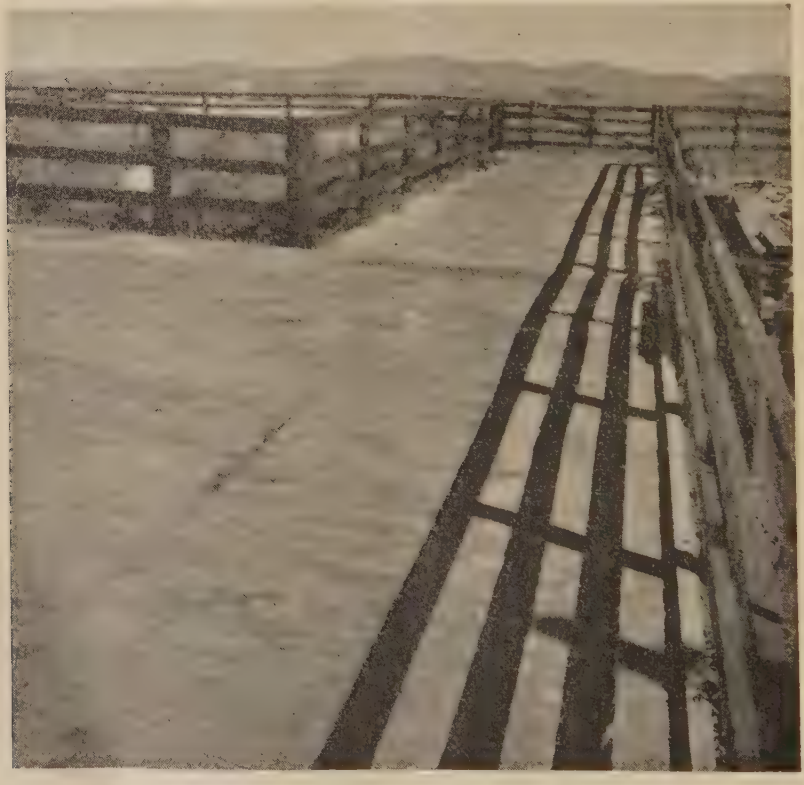

Plate 8.

Concrete Laneway Leading to Concrete Holding Yard at Entrance to Bails.

facilities for herd recording could be incorporated in the design.

Feed grinding and storage rooms are provided as a wing to the main shed structure, and are situated at the opposite end of the milking shed from the cream room. These feed rooms are also covered with a gable-type roof and the whole roof of the building has been painted externally and internally with bitumastic aluminium paint. The milking shed is 66 ft. long by 15 ft. wide and the feed storage wing is 34 ft. long by 16 ft. wide.

A special feature of this dairy is the large area of concrete in the holding yards at the entrance to and exit from the bails (Plate 8). The dimensions of the concrete yards are 42 ft. x 68 ft., and 60 ft. x 52 ft., respectively. Concrete drinking troughs are provided in both holding yards (Plate 9). Manure collected in these yards is washed under high water pressure into two liquid manure pits provided at the lower side of each yard. The dimensions of the manure pits are 12 ft. x 6 ft. x 5 ft. deep.

It is interesting to note that liquid manure is being pumped into a 500-gallon welded steel tank on two aircraft wheels. The pump is a milking machine vacuum pump driven direct by a shaft and universal from a tractor power take-off. The principle of the system is the lowering of the pressure in the tank by removing some of the air with the vacuum pump, with the result that the liquid manure is drawn into the tank. This tank fills with liquid manure in approximately seven minutes. The liquid manure is used for topdressing pastures.

A covered yard is not provided, as this locality is not in the heavy rainfall belt, but the building has been situated in such a position that the feed room wing protects the bails from wind and much of the rain. During fine weather the layout of this shed allows the sun to shine on the bail floors and through the wash-up room windows on to the utensil draining racks.

Calf feeding bails have been erected at the rear of the milking shed, form-

Plate 9.

Water Trough in Large Concrete Holding Yard.

Plate 10.

Rear of Milking Shed. Note the large concrete holding yard, the water trough and the calf-feeding bails.

Plate 11.

View of Separator Room and Wash-up Room.

ing one side of the rear holding yard, and are accessible through a door in the large airspace (Plate 10). Calves are fed on well drained concrete floors. Calf pens for the very young calves are provided adjacent to the feed rooms, and open out onto the front concrete yard. These calf pens are provided with concrete floors and are well drained.

A 7,000 gallon concrete tank has been constructed for water storage, and water from this tank is reticulated to points in the bails, airspace and wash-up room (Plate 11).

The vat stand and utensil racks are constructed of ½ in. galvanised piping (Plate 12). The vat stand is not a fixture and may be moved during cleaning of the separator room floor. Simple, but very efficient, can racks are provided by nailing 6 in. x 1 in. chamfer boards horizontally to 4 in. space blocks on the internal separator room walls. Cans are upturned and the handles of the cans are fitted over the chamfer boards (Plate 13).

Electric power is connected to this dairy, and milking machines and separator are driven by electric motors. A diesel engine is provided for use during electric power failures.

This Combined Dairy Building, complete with feed rooms and dairy plant, cost approximately £2,900. Thirty-two tons of cement were laid in floors and yards; this alone cost more than £600, which in this district is the average price of a well built two-unit milking shed.

It is not suggested that farmers erect milking sheds as costly as that erected by Stephenson Bros. However, a standard three-unit Combined

Plate 12.

Separator Room, with Metal Vat Stand.

Dairy Building, similar to that outlined earlier in this article, and which in this district costs between £700 and £900 to erect, should be the aim of those dairymen desirous of replacing their old milking sheds.

Plate 13.

Cans on Racks in the Wash-up Room.

What Insect is This?

Answer: The bronze orange bug.

This is only one of 300 illustrations which appear in the Department's Handbook on "Insect Pests and Diseases of Plants".

See the announcement on page 128 of this journal for further details.

Payment for Cheese-Milk According to Quality is Justified.

By T. A. MORRIS, Dairy Research Laboratory.

In the past, proposals for the institution of a system of cheese-milk grading coupled with differential payments according to grade have received scant acceptance. At times they have even incurred stern opposition.

The reason for this is difficult to conceive. In view of the existing urgent necessity to improve the quality of our cheese in order to increase local consumption and to maintain payable export prices, it seems an opportune time to consider thoroughly this matter of payment according to quality.

The first question which is likely to demand an answer is, "What should be the criterion of good quality cheese-milk?"

To satisfy this query, a full consideration of various milk grading tests which are applicable to milk for cheese manufacture would need to be made. It is not the intention to deal with this aspect here. For the moment it suffices to say that the milk should be judged on its suitability for the manufacture of cheese of high quality.

The principle of paying for an article according to its quality is not new. It is one which has been widely accepted since the earliest occasions of trade. In Queensland in the dairying industry itself there is an example of this in the payment for cream according to its grade—a practice which has operated since 1935.

Bacteria Do Count.

In addition to, or apart from, the presence of feedy, weedy, or absorbed foreign flavours, milk may be regarded as poor in quality because of the presence of a large number of bacteria.

It is most unlikely that anyone would agree that an apple was worth the price of an apple irrespective of its grub content. Yet there are some who see no reason for paying a different price for milk according to its bacterial content.

Certainly all bacteria are not harmful and indeed some are quite healthful. But the unfortunate fact is that both harmless and harmful types come from much the same sources and an indication of a large number of bacteria in milk is commonly an indication of numbers of undesirable bacteria. The simplest and most effective means of ensuring that milk in the raw state contains only a small number of undesirable organisms is by ensuring, through hygienic milk production and suitable cooling, that the total of organisms present in the milk is small.

Realising that the cheesemaking process involves the growing of bacteria in the milk, some farmers are inclined to the belief that it is of little consequence, and maybe to advantage, if their milk arrives at the factory with a large number of bacteria already in it.

Quite apart from the relationship of the sources of contamination for the various types of bacteria, there is the important consideration of uniformity in cheese manufacture. If no attempt is made to limit the bacterial content of the milk, the control of the cheesemaking process becomes extremely difficult. In an endeavour to produce satisfactory cheese the cheesemaker has to be constantly changing his technique. There can be no working "by the clock," as acidities, times, temperatures, the amount of dry stirring and the salting rate all have to be varied from day to day and even from vat to vat. The production of a good even line of cheese is impossible without a great deal of extra effort, and even then it is unlikely.

Given milk with a constantly low bacterial population, the cheesemaker

can add specially selected and purified starter cultures which are capable of giving a uniform rate of acid production from day to day. Thus, from this fixed starting point he can much more easily attain the desired end point, which is the production of good quality cheese, than he can when the very beginning involves factors which are indefinite, inconstant and unknown.

From dirty udders of the cows, from unclean milking machines, from flies, and from dust and dung, milk may gain a great variety of bacteria. Coliform organisms which may produce gas holes in the cheese—and whether they produce gas or not may cause "dirty," "unclean" flavours—can occur along with ordinary lactic acid bacteria. Added to these may be numbers of micrococci which may cause bitterness, and other organisms which can bring about a "breaking down" of the protein of the cheese in such a manner that foul putrefactive odours arise. The great variety of lactobacilli which may occur in the milk and the cheese have both good and bad effects. Some may cause a "rotten egg gas" flavour and others slit-openness. The presence of yeasts in cheese may give rise to fruity and fermented flavours and also bitterness.

Although pasteurisation destroys most of the lactic organisms, others may survive. In any case there is always a percentage survival and thus the greater the initial bacterial content of the milk the greater is the number of organisms living after pasteurisation. Also, it is worthy of note that pasteurisation does not rid the milk of any detrimental changes which the bacteria may have effected before being destroyed. For example, "dirty" and "cowy" flavours and high acidity remain.

It may appear to some that it would be well to allow large numbers of souring organisms to occur in the milk in order to "protect it" from other undesirable bacteria. However, it may be pointedly stated that clean milk needs no such "protection."

The desirability of obtaining milk for cheesemaking with a low bacterial content is thus readily established. It should follow, therefore, that payment for the milk should be on such a basis that milk with a low bacterial content procures a greater payment than milk with a high bacterial content.

Differential Payments and Company Finances.

Most dairy companies are co-operatives. This means that there is no loss to the suppliers as a body when a number incur a lower rate of payment because of the supply of milk of inferior quality. What these suppliers lose others gain and final or deferred payments cause a balancing of premiums and penalties. In this connection it is worth while noting that if the grading standard is set too high the differential becomes ineffective. So much money would be retained by the company during the year because of the bulk of payments being for lower grade milk that the deferred payment made at the end of the year, to all the suppliers, would be almost sufficient to recompense the suppliers of poor quality milk for the penalties incurred during the year. This can best be illustrated by the following hypothetical case:—

Suppose: (i.) A supply of 100,000 lb. of butterfat per year.

(ii.) 80% of milk incurs the lower rate of payment.

(iii.) A price differential of 2d. per lb. butterfat.

Then, additional funds available for distribution at end of year as a result of retention of 80% of quality premiums

$$= 100{,}000 \times 2 \times \frac{80}{100} \text{d.}$$

$$= 100{,}000 \times 2 \times \frac{80}{100} \times \frac{1}{100{,}000} \text{d.}$$

per lb. butterfat.

= 1.6d. per lb. butterfat.

Therefore, net quality differential

= (2-1.6)d. per lb. butterfat

= 0.4d. per lb. butterfat.

As far as proprietary companies are concerned, their record of payments to suppliers is good and free competition by co-operatives should be sufficient to ensure that such remains the case.

Effect on Factory Employees.

Having been given evidence of an attempt to obtain a high standard of quality in the milk supplies, the factory operatives could be expected to be more inclined to do their best to attain a high standard of quality in the cheese. "Give us good milk and we will make good cheese" is a claim which is frequently made and could, I think, just as frequently be proved.

Effect on the Grader.

The milk grader must receive consideration because it is his task to penalise or to reward as the case may be. Milk graders may be inclined to think that in the interests of a peaceful life not troubled by the attacks of irate farmers they would be better to refrain from supporting a system of payment according to quality. However, their lot need not be such an unhappy one, because milk grading can be readily placed on an objective basis. That is, the milk can be tested in a manner which yields a result not subject to the interpretation or opinion of the individual. For example, if a methylene blue test of the milk is carried out and the dye loses its colour in one hour, that is an end to it. No amount of arguing can extend the period of time during which the colour remains. On the other hand, the cream grader has a more difficult task because the grade he allots is subject to his own opinion, based of course on sound experience.

The milk grader can indeed become the farmers' best friend. By promptly passing on the results of grading tests he can help the supplier in his endeavours to improve the quality of his milk. The comparative effectiveness of remedial measures adopted can be shown and thus a good liaison can be built up between the farmer and the dairy company.

Effect on Suppliers.

There would be something more than personal satisfaction for the supplier of good quality milk. He would gain an actual monetary reward which would encourage him to "keep up the good work".

The supplier of poor milk has to bear with a lower financial return. He therefore is affected in such a manner that is most likely to cause him to make an effort to improve the quality of his product. The penalty that he pays for supplying poor quality milk acts as a compensation to other suppliers for his lowering of the quality of the cheese manufactured or for at least making the manufacture of good quality cheese more difficult.

A supplier may feel that he is unjustly penalised when he receives only second grade price for his milk because it is strongly "weedy" or "feedy". Such defects, he may maintain, are due to circumstances beyond his control. However, by controlled grazing, by the proper management of pastures and by the use of modern hormone weed killers such troubles can be reduced.

It should be apparent from the above that no class of individuals concerned in a system of payment for milk according to quality could rightly claim that they were being unjustly penalised. Any losses incurred by suppliers could be regarded as self inflicted.

Cheese Quality and Price.

Convinced though we may be that payment for milk on a quality basis will encourage the production of better milk and better cheese, we may be excused for asking if the institution of the system is justified if cheese market realisations are mainly independent of quality.

It has been found that there is not a lasting relationship between the quality of cheese offered and the price obtained. In times of short supply the price commanded by a low quality

product may be higher than that commanded by a much superior grade of produce when the supply is plentiful. That is, supply and demand exercise such a strong influence on the price obtainable that the quality of the product may become of secondary importance in this respect.

However, it is becoming more and more obvious that those countries (or factories) which have a record of consistent production of good quality cheese will find more and better markets open to them than will those which have grown complacent under marketing conditions which have not demanded a discrimination in cheese quality. In the long-term view it can be seen that it is definitely wise to maintain a high standard of quality in the manufactured article. By so doing the manufacturer ensures that when the disposal of produce is difficult his will be sought out by buyers.

Thus although at times it may appear that choice grade cheese does not command a higher price than first, this is no basis for arguing that the industry is just as well off for producing cheese of the lower grade.

INOCULATION OF LEGUME SEEDS.

★

The Department of Agriculture and Stock supplies cultures of bacteria for the inoculation of seeds of legumes such as Poona pea, blue lupins, lucerne and clovers.

Seed inoculation is often necessary where the legume intended for planting has not previously been grown successfully, as it provides the plants with bacteria which are necessary for their full development.

Cultures are supplied free and post free. They are in bottles and have to be mixed with skim milk for sprinkling on the seed.

Order from the Under Secretary, Department of Agriculture and Stock, Brisbane, at least 10 days before sowing. State amount and type of seed to be treated.

QUEENSLAND
DEPARTMENT OF AGRICULTURE AND STOCK

STANDARDS BRANCH
Pamphlet No.53

REGISTERED
S T O C K F O O D S

"The Agricultural Standards Act of 1952"

F. B. Coleman
Standards Officer, Standards Branch.

Supplement to "The Queensland Agricultural Journal," March, 1955.

A. H. TUCKER, Government Printer, Brisbane.

QUEENSLAND
DEPARTMENT OF AGRICULTURE AND STOCK

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Pamphlet No.53

REGISTERED
S T O C K F O O D S

"The Agricultural Standards Act
of 1952"

F. B. Coleman
Standards Officer, Standards Branch.

REGISTERED STOCK FOODS

as at

3rd September, 1954.

Key to Symbols Used

(a) from bone
(b) from pulverised limestone
(c) from bone flour or meal
(d) from calcium carbonate
(e) from calcium hydroxide
(f) from calcium phosphate
(g) from calcium sulphate
(h) from bone char
(k) from sodium phosphate
(l) from defluorinated rock phosphate
(m) from degelatinised bone flour
(n) from meat and bone meal
(o) from oystershell
(u) from gypsum
(v) from shell flour or grit
(w) from clamshell
(x) from eggshell flour
(y) from iron oxide
(z) from limonite

"THE AGRICULTURAL STANDARDS ACT OF 1952"

Registered Stock Foods

compiled by

The Registration Section of the Standards Branch.

A prepared stock food is any kind of meal or food for any stock, prepared, whether in whole or in part, from one or more than one kind of grain or oils or nuts or juices or meats or other materials of a like nature, and any condimental, patented, or proprietary food for stock possessing or claimed to possess nutritive properties or nutritive as well as medicinal properties, and any material of animal or vegetable origin produced in any process of treatment of manufacture not being the primary object of such process, and any salt or any mineral feed or supplement for stock and any material used or intended as a lick for stock or stock lick.

All preparations included in the above definition come within the ambit of "The Agricultural Standards Act of 1952" and are governed by specific Regulations under this Act. These Regulations are known as "The Agricultural Standards (Stock Foods) Regulations of 1953."

Before a preparation of this nature is offered for sale in this State, the Queensland primary dealer must submit an application for registration to the Standards Officer. If the application is in order and the preparation and labelling complies in all respects with the requirements as set out in the Regulations, the Standards Officer duly registers the preparation which can then be marketed throughout the State.

Once on the market in Queensland, the preparation is subject to continual surveillance by inspectors appointed under the Act. Inspections are made and samples taken for analysis to insure that the preparation is consistent with the guaranteed analysis shown on the label and conforms with specified standards where prescribed.

The Stock Foods registered up to the 3rd September for the three year period, January 1953, to January 1956 under the Agricultural Standards Act are set out in the accompanying list.

It should be noted that the sale of any unregistered Stock Food would render the seller liable to a penalty not exceeding £100.

Further particulars and copies of "The Agricultural Standards (Stock Foods) Regulations of 1953" may be obtained from the Standards Branch, Department of Agriculture and Stock, William Street, Brisbane.

LIST OF STOCK FOODS REGISTERED IN QUEENSLAND UNDER "THE AGRICULTURAL STANDARDS ACT OF 1952"
For the Period Commencing January 1953, as at 3rd September 1954

Name of Preparation	Guaranteed Analysis				Queensland Primary Dealer
	Min. Crude Protein %	Min. Crude Fat %	Min. Phos. Acid (P_2O_5) from bone %	Min. Lime (CaO) from bone %	
ANIMAL BY-PRODUCTS					
BLOOD MEAL					
Imperial Dried Blood Meal (Sterilised)	80.0				The Central Queensland Meat Export Co. Ltd.
PTL Blood Meal	78.0				Provincial Traders Pty. Ltd.
PTL Blood and Liver Meal	62.5	10.0			Provincial Traders Pty. Ltd.
Q.M.E. Blood Meal	75.0				Qld. Meat Export Co. Ltd.
Blood Meal	77.0				Qld. Meat Industry Board
Swift Blood Meal	75.0				Swift Australian Co. (Pty.) Ltd.
Tancbros. Blood Meal	75.0	4.0			Tancred Bros. Pty. Ltd.
BONE MEAL AND FLOUR					
Imperial Bone Meal (Sterilised)	12.5		26.0	32.0	The Central Queensland Meat Export Co. Pty. Ltd.
Tri-Cal-Os Sterilised Bone Flour	5.0		30.0	40.0	Davis Gelatine (Aust.) Pty. Ltd.
Tri-Cal-Os Sterilised Bone Grit	5.0		30.0	40.0	Davis Gelatine (Aust.) Pty. Ltd.
Calphos	20.0		25.0	30.0	Qld. Meat Industry Board
LIVER MEAL					
Imperial Liver Meal (Sterilised)	65.0	18.0			The Central Queensland Meat Export Co. Pty. Ltd.
PTL Liver Meal	55.0	20.0			Provincial Traders Pty. Ltd.
Liver Meal	65.0	12.0			Qld. Meat Industry Board
Swift Liver Meal	60.0	12.0			Swift Australian Co. (Pty.) Ltd.

Q.M.E. Meat Meal	60.0	9.0			Qld. Meat Export Co. Ltd.
MEAT AND BONE MEAL					
Borthwicks Mebo Meal	45.0	10.0	10.0	12.0	Thomas Borthwick & Sons (Aust.) Ltd.
Imperial Fortified Protein Meal (Sterilised)	50.0	8.0	10.25	12.0	The Central Queensland Meat Export Co. Pty. Ltd.
"Buruda" Meat and Bone Meal	54.0	13.5	7.0	8.0	Darling Downs Co-op. Bacon Assn. Ltd.
Darling Downs KR Meat and Bone Meal	50.0	13.5	6.5	8.0	Darling Downs Co-op. Bacon Assn. Ltd.
Meat and Bone Meal	48.0	12.0	6.0	7.0	Hutton & Foggitt Jones
"Golden Grove" Meat & Bone Meal	35.5	10.0	12.0	17.0	North Queensland Co-op. Bacon Assn. Ltd.
PTL Meat & Bone Meal	45.0	10.0	10.0	12.0	Provincial Traders Pty. Ltd.
Q.M.E. Meat & Bone Meal	50.0	10.0	10.0	8.0	Qld. Meat Export Co. Ltd.
Protein Meal	55.0	8.0	6.0	7.0	Qld. Meat Industry Board
Swift Meat and Bone Meal	50.0	8.0	5.0	5.0	Swift Australian Co. (Pty.) Ltd.
Tancbros. Meat and Bone Meal	50.0	10.0	7.0	10.0	Tancred Bros. Pty. Ltd.
MILK PRODUCTS					
			Min. Lactose and Lactic Acid %	Mineral Salts %	
"Unity" Buttermilk Powder	30.0	9.0	38.0	8.0	The Downs Co-op. Dairy Assn. Ltd.
"Unity" Whey Powder	11.0	0.5	68.0	8.0	The Downs Co-op. Dairy Assn. Ltd.
"Glenrock" Buttermilk Powder	30.0	9.0	38.0	8.0	The Esk Co-op. Dairy Assn. Ltd.
"Jacaranda" P.D.B. Dried Buttermilk Powder	35.0	4.0			The Queensland Farmers Co-op. Assn. Ltd.
F.M.S. Milk Equivalent	23.0	1.5	Vitamin A 10 i.u. per gram Vitamin D 1 i.u. per gram		Mr. E. C. Horn
Krafco	10.0	0.5	68.0% Min. Lactose 1.0% Min. phos. acid (P_2O_5) from milk 0.7% Min. lime (CaO) from milk		

Name of Preparation	Guaranteed Analysis				Queensland Primary Dealer
	Min. Crude Protein %	Min. Crude Fat %	Min. Crude Fibre %	Max. Salt %	
PLANT PRODUCTS					
COCONUT MEAL					
Key Meal	20.0	5.0	7.0	1.0	Lever Bros. Pty. Ltd.
"Barnes" Coconut Oilmeal	21.0	1.5	12.0		E. J. Lewis
COTTONSEED MEAL					
"Bacal" Cottonseed Meal	40.0	5.0	15.0		The Cotton Marketing Board
C.M.B. No.2 Cottonseed Meal	35.0	5.0	20.0		The Cotton Marketing Board
LINSEED OIL MEAL					
Meggitt's Linseed Oil Meal	30.0	3.5	11.0		Gollin & Co. Pty. Ltd.
LUCERNE MEAL					
"Red Comb" Lucerne Meal	15.0	1.2	30.0		Poultry Farmers Co-op. Society Ltd.
MAIZE MEAL					
Maize Meal	10.0	3.5	4.0		Addis Bros. Pty. Ltd.
Athmaze Maize Meal	9.0	4.0	4.0		The Atherton Tableland Maize Marketing Board
Maize Meal	9.5	3.8	3.0		Henry Dean & Sons Pty. Ltd.
"Lamberts" Maize Meal	10.0	5.0	5.0		G. & W. Lambert Ltd.
Maize Meal	9.5	3.5	5.0		R. G. Patterson
"Red Comb" Maize Meal	10.0	3.5	3.5		Poultry Farmers Co-op. Society Ltd.
Maize Meal	9.5	3.5	3.0		State Produce Agency Pty. Ltd.
PEANUT MEAL					
"Bacal" Peanut Meal	40.0	7.0	10.0		The Cotton Marketing Board
SUNFLOWER MEAL					
"Bacal" Sunflower Meal	30.0	10.0	15.0		The Cotton Marketing Board

SORGHUM MEAL				
Sorghum Meal	10.0	2.2	2.3	Addis Bros. Pty. Ltd.
Sorghum Meal	9.0	2.2	2.3	Henry Dean & Sons Pty. Ltd.
"Lamberts" Sorghum Meal	10.0	2.0	2.5	G. & W. Lambert Ltd.
Sorghum Meal	9.5	2.0	3.0	R. G. Patterson
"Red Comb" Sorghum Meal	10.0	2.5	2.5	Poultry Farmers Co-op. Society Ltd.
"P.D.S." Sorghum Meal	9.5	2.5	3.5	The Producers' Co-op. Distributing Society Ltd.
"S.P.A." Sorghum Meal	12.0	2.2	2.3	State Produce Agency Pty. Ltd.
WHEAT MEAL				
Wheat Meal	12.0	1.4	3.0	Addis Bros. Pty. Ltd.
"Lamberts" Wheatmeal	12.0	1.5	5.0	G. & W. Lambert Ltd.
Wheatmeal	10.0	1.1	3.5	The Maleny Co-op. Dairy Assn. Ltd.
Wheat Meal	12.0	1.5	5.0	R. G. Patterson
"Red Comb" Wheat Meal	10.2	1.5	3.5	Poultry Farmers Co-op. Society Ltd.
Cerevite Rolled Wheat	12.0	1.8	2.4	Queensland Cereal Industries Pty. Ltd.
Cerevite Wheat Meal	12.0	1.8	2.4	Queensland Cereal Industries Pty. Ltd.
Crushed Wheat	14.7	1.0	4.0	Queensland State Wheat Board
Wheatmeal	14.7	1.0	4.0	Queensland State Wheat Board
"S.P.A." Wheat Meal	12.0	1.5	5.0	State Produce Agency Pty. Ltd.
WHEAT BY-PRODUCTS				
Bran	15.5	3.0	9.0	Barnes Milling Ltd.
Bran	16.0	2.5	11.0	Dalby Milling Co. Pty. Ltd.
Bran	15.0	2.0	11.0	Defiance Milling Co.
Bran	14.0	2.5	12.0	Gillespie Bros. (Qld.) Pty. Ltd.
Bran	14.5	2.5	11.0	Poultry Farmers Co-op. Society Ltd.
Bran	14.7	2.6	11.0	The Queensland Co-op. Milling Assn. Ltd.
Bran	15.5	2.5	11.0	Warwick Flour Mills
Pollard	14.3	3.2	7.0	Barnes Milling Ltd.
Pollard	16.5	3.5	7.0	Dalby Milling Co. Pty. Ltd.
Pollard	15.0	3.0	7.0	Defiance Milling Co.
Pollard	14.3	3.2	7.0	Gillespie Bros. (Qld.) Pty. Ltd.
Pollard	14.0	3.0	7.0	Poultry Farmers' Co-op. Society Ltd.
Pollard	13.0	2.5	10.0	The Queensland Co-op. Milling Assn. Ltd.
Pollard	15.5	3.5	7.0	Warwick Flour Mills

Name of Preparation	Guaranteed Analysis								Miscellaneous	Queensland Primary Dealer
	Min. Crude Protein %	Min. Crude Fat %	Max. Crude Fibre %	Min. Phos. Acid (P_2O_5) from bone %	Min. Lime (CaO) from bone %	% Min. Lime (CaO)	% Max. Salt	% Max. Molasses		
PROPRIETARY MIXTURES										
CALF MEAL										
Calf Food	18.5	4.0	5.5				1.5		0.0076% Min. Iron (Fe) as Sulphate of Iron 0.006 % Min. Magnesia (MgO) as Magnesium Sulphate	Annand, Robinson & Co. Pty. Ltd.
Budds Standard Calf Food	18.5	4.4	6.0	0.9	1.0	1.0 (d)	0.5			Budds Farm Supplies Pty. Ltd.
Kaf-O-Vite	16.5	9.5	7.5	0.8(h)	1.0(h)	0.5 (d)			0.6 % Max. Cane Sugar	Goldsbrough, Mort & Co. Ltd.
Lambert's Calf Food	17.8	3.9	5.9				1.5			G. & W. Lambert Ltd.
"Red Star" Calf Food	15.0	3.0	8.0	0.5	0.9	0.5 (b)	1.0			Lynch & Pollock Pty. Ltd.
Vetamac Calf Food	15.35	7.5	1.5							A. H. McDonald & Co.
"Red Comb" Calf Food	15.0	2.5	6.5	0.1	0.1	0.05(t)	0.5		0.02 % Min. Sulphur (S) as Ground Sulphur 0.001 % Min. Iron (Fe) as Iron Sulphate 0.001 % Min. Magnesia (MgO) as Epsom Salts ½ oz. Potassium Iodide to 2,000lb.	Poultry Farmers' Co-op. Society Ltd.
Cerevite Calf Food	18.0	3.5	7.5	0.5	0.4	1.0 (b)	1.5			Queensland Cereal Industries Pty. Ltd.
"Hibiscus" Calf Food	16.0	3.0	9.0	0.37	0.45		1.0			Queensland Pastoral Supplies Pty. Ltd.
				0.5	0.9	0.5 (b)	1.0			R. A. Tulloch.

CALF STARTER MEAL

"Supastok" Dairy Meal(Calves)	20.0	3.3	7.0	0.4	0.5	1.3(b)	1.3			Barnes Milling Limited.
Budds "Fortified" Calf Food	23.0	4.0	6.0	0.8	1.0	1.0(d)	0.5			Budds Farm Supplies Pty. Ltd.
Enrights Calf Starter Meal	22.5	4.0	5.0	0.8	1.0	0.5(b)	1.5			Enrights Pty. Limited.

DAIRY FEED MEAL

"Supastok" Dairy Meal(Cows)	18.0	3.0	8.5	0.4	0.5	1.3(b)	1.3			Barnes Milling Limited.
Bona Vista Dairy Meal	20.7	4.0	6.0	2.4	2.8		1.5			Bona Vista Electric Hatchery.
Budds "Milkmaker" Dairy Concentrate	18.0	4.0	8.5			0.6(d)	2.0			Budds Farm Supplies Pty. Ltd.
J.P.C. Dairy Meal	17.0	2.8	7.0	1.8	2.2		2.5	6.0		J. P. Cranley Pty. Ltd.
Enrights Dairy Food	18.5	4.0	7.0	1.0	1.2	0.5(b)	1.5			Enrights Pty. Limited.
Enrights Dairy Meal	18.5	4.0	7.0	1.0	1.2	0.5(b)	1.5			Enrights Pty. Limited.
Double J Dairy Meal	17.0	2.8	7.0	1.8	2.2		2.5	6.0		J. Jackson & Co. (P.&S.) Pty. Ltd.
"Sunland"Dairy Meal	17.0	2.8	7.0	1.8	2.2		2.5	6.0		J. Jackson & Co. (P.&S.) Pty. Ltd.
"Williams" Dairy Meal	17.0	2.8	7.0	1.8	2.2		2.5	6.0		J. Jackson & Co. (P.&S.) Pty. Ltd.
Laidlaw's Dairy Meal	17.0	2.8	7.0	1.8	2.2		2.5	6.0		G. Laidlaw & Co.
"Red Star" Dairy Food	17.0	5.0	8.0	0.7	1.1	0.5(b)				Lynch & Pollock Pty. Ltd.
CMA Dairy Meal	19.5	3.2	8.0	1.4	1.5					The Queensland Co-op. Milling Assn. Ltd.
S.P.A. Dairy Cow Meal	20.0	4.0	6.5	1.2	1.4		1.5			State Produce Agency Pty. Ltd.
"I.X.L." Dairy Food	17.0	5.0	8.0	0.7	1.1	0.5(b)				R. A. Tulloch.

SHEEP CUBES AND/OR MIXTURES

A. & R. Sheep Cubes	14.5	2.0	4.0	0.7	0.8	1.1(b)			0.005 % Min. Copper (Cu) as Copper Sulphate	Annand, Robinson & Co. Pty. Ltd.
"Supastok" Sheep Nuts	16.5	2.5	10.0	0.6	0.7	0.9(b)	0.9			Barnes Milling Limited.
P.D.S. Ltd. Allowrie Producer Sheep Nuts	10.0	3.0	10.0			0.5(d)	1.5			The Producers' Co-operative Distributing Society Ltd.
Promol	18.0	2.5	5.0	1.8	2.0		1.5	17.0	4 oz. Manganese Sulphate to 2,240lb. 1 mg. Vitamin B_2 per lb.	Protein Stock Foods Pty. Ltd.
Cerevite Sheep Concentrate For Feeding to Flock Rams	15.5	3.5	7.0	0.4	0.5	0.6(b)			5mg./lb. Max. Copper (Cu) as Copper Sulphate	Queensland Cereal Industries Pty. Ltd.
Cerevite Sheep Concentrate For Feeding to Stud Sheep	13.0	3.5	4.5			1.2(b)			5mg./lb. Max. Copper (Cu) as Copper Sulphate	Queensland Cereal Industries Pty. Ltd.

Name of Preparation	Guaranteed Analysis								Queensland Primary Dealer
	Min. Crude Protein %	Min. Crude Fat %	Max. Crude Fibre %	Min. Phos. Acid (P_2O_5) from bone %	Min. Lime (CaO) from bone %	Min. Lime (CaO) %	Max. Salt %	Miscellaneous	
PIG MEAL AND/OR FOOD									
A & R Pig Food	15.0	2.0	6.0	0.6	0.7	0.9 (b)	1.5		Annand, Robinson & Co.Pty.Ltd.
"Supastok" Brood Sow Cubes	17.0	3.0	6.0	0.3	0.4	1.0 (b)	1.5		Barnes Milling Limited
"Supastok" Brood Sow Meal	17.0	3.0	6.0	0.3	0.4	1.0 (b)	1.5		Barnes Milling Limited
"Supastok" Pig Cubes	16.0	3.0	8.5	0.3	0.4	0.5 (b)	1.5		Barnes Milling Limited
"Supastok" Pig Meal	16.0	3.0	8.5	0.3	0.4	0.5 (b)	1.5		Barnes Milling Limited
Budds Brood Sow Meal	16.5	3.6	5.5	1.0	1.1	1.3 (d)	1.0		Budds Farm Supplies Pty. Ltd.
Budds "Growfast" Pig Meal	12.3	3.6	4.5	0.4	0.5	0.7 (d)	1.0		Budds Farm Supplies Pty. Ltd.
"Red-Comb-R" No.1 Pig Food	12.8	2.7	5.7	0.2	0.3	0.4 (b)	1.3		Central Queensland Co-op. Stock Foods Society Ltd.
"Red-Comb-R" No.2 Pig Food	13.2	2.7	5.7	0.3	0.4	0.4 (b)	1.3		Central Queensland Co-op. Stock Foods Society Ltd.
Enrights Pig Food	19.0	3.5	5.5	1.0	1.3	0.5 (b)			Enrights Pty. Ltd.
Enrights Pig Meal	19.0	3.5	5.5	1.0	1.3	0.5 (b)			Enrights Pty. Ltd.
"Double J" Pig Starter Meal	18.5	3.0	5.5	1.5	2.5		1.5		J. Jackson & Co. (P. & S.) Pty. Ltd.
"Jacksons" Pig Starter Meal	18.5	3.0	5.5	1.5	2.5		1.5		J. Jackson & Co. (P. & S.) Pty. Ltd.
"Red Star" Pig Food	14.0	3.0	6.5	0.65	0.75				Lynch & Pollock Pty. Ltd.
Osmonds Codlivine for Pigs	20.0	12.0	9.0	3.0	3.5			1.0% Min. sulphur (S) as flowers of sulphur	Osmond & Sons (Aust.) Pty. Ltd.
"Prolin" Concentrate	13.0	2.0	5.0	0.9 2.0(h)	1.0	3.0 (h)	4.0	21.5% Max. molasses	Protein Stock Foods Pty. Ltd.
Cerevite Pig Food	18.0	3.0	7.5	0.8	0.9	1.3 (b)	1.5		Queensland Cereal Industries Pty. Ltd.
CMA Pig Meal	15.0	2.5	7.5	0.1	0.2		1.0		Queensland Co-op. Milling Assn. Ltd.
"I.X.L." Pig Food	14.0	3.0	6.5	0.65	0.75				R. A. Tulloch
Royal Pig Meal	16.4	2.3	5.8	1.35	1.6		1.5	0.001 gms./lb. riboflavin	Warwick Flour Mills

Name of Preparation	Guaranteed Analysis													Queensland Primary Dealer
	Min. Crude Protein %	Min. Crude Fat %	Max. Crude Fibre %	Min. Phos. Acid (P2O5) from bone %	Min. Lime (CaO) from bone %	Min. Lime (CaO) %	Max. Salt %	Manganese Sulphate ozs/ton	Min. Manganese ozs/ton	Vitamin A I.U./lb.	Vitamin D3 I.U./lb.	Vitamin B2 mgs./lb.	Max. Charcoal %	
POULTRY MASHES														
ALL MASH														
Bona Vista Bundy All Mash	16.5	3.0	7.0	1.5	1.8	0.75(o)	1.0	4						Bona Vista Electric Hatchery.
"HDS" Brand All-Mash	15.0	2.5	8.0	0.5	0.6		1.0							Henry Dean & Sons Pty. Ltd.
"Red Star" All Mash	15.0	3.0	7.0	0.5	1.4	1.0 (b)	1.0							Lynch & Pollock Pty. Ltd.
C.M.A. All Mash	16.0	3.5	5.0	0.8	1.0		1.0							The Queensland Co-op. Milling Assn. Ltd.
ALL PELLETS														
A & R Product All Pellet No.2 (For Breeders)	15.5	3.0	7.0	1.0	1.1		1.0	6		4000	400	1.6		Annand, Robinson & Co. Pty. Ltd.
BREEDERS MASH														
"Supastok" Breeder Mash	17.6	3.0	9.0	0.3	0.4	1.0 (b)	1.0	1¼				1.3		Barnes Milling Limited.
Budds "Superhatch" Breeders Mash	17.0	2.5	7.0	1.5	2.0	1.4 (d)	1.0		1¼			2.6		Budds Farm Supplies Pty. Ltd.
Shur-Pro Breeders' Mash	18.5	3.5	7.5	0.55	0.68		1.0	4				1.3		J. Jackson & Co. (P.&S.) Pty. Ltd.
"N.B." Utility Poultry Mash	18.0	3.8	7.5	1.5	1.8		1.0		1¼			1.3		Nicholls Brothers.
R.G.P. Standard Laying Mash	17.0	2.5	6.1	0.4	0.5		1.0		1¼			1.3		R. G. Patterson.
Red Comb Wunda Breeders Mash	17.0	4.0	7.0	0.57	0.69		1.0	4				1.3		Poultry Farmers Co-operative Society Ltd.
P.D.S. Vitaminised Breeders Laying Mash	17.0	3.0	9.0	0.3	0.3	2.0 (o)	1.0		1¼	2000	135	1.3		The Producers' Co-operative Distributing Society Ltd.
Cerevite Breeder Mash	17.0	3.5	9.0			1.2 (o)	1.0		1¼			1.3		Queensland Cereal Industries Pty. Ltd.

Name of Preparation	Guaranteed Analysis												Queensland Primary Dealer
	Min. Crude Protein %	Min. Crude Fat %	Max. Crude Fibre %	Min. Phos. Acid (P_2O_5) from bone %	Min. Lime (CaO) from bone %	Min. Lime (CaO) %	Max. Salt %	Manganese Sulphate ozs/ton	Min. Manganese ozs/ton	Vitamin A I.U./lb.	Vitamin D_3 I.U./lb.	Vitamin B_2 mgs./lb.	Max. Charcoal %	
BREEDERS PELLETS														
"Supastok" Breeder Pellets with Vitamins A + D_3 Added	17.6	3.0	9.0	0.3	0.4	1.0(b)	1.0	1¼		3000	300	1.3		Barnes Milling Limited
CHICKEN MASH														
"Magnetic" Chicken Mash	18.5	4.0	6.5	0.9	0.7		1.0		2	2000	135	1.6		Samuel Allen & Sons Limited
Athmaze Chick Mash	19.0	4.5	5.5	1.6	1.9		1.0	2				1.6		The Atherton Tableland Maize Marketing Board
"Supastok" Starter Mash with Vitamins A + D_3 Added	20.0	3.0	7.0	0.6	0.7	1.0(b)	1.0	6		2000	200	1.6		Barnes Milling Limited
Bona Vista Growfast Chick Mash	18.0	3.4	6.5	1.4	1.6		1.0	4				1.6		Bona Vista Electric Hatchery
Budds K.I. Chick Starter	19.0	3.5	6.0	0.9	0.9	0.9(d)	1.0	2				1.6		Budds Farm Supplies Pty. Ltd.
Budds "Sturdy Chick" Battery Mash	19.5	3.3	6.0			0.7(d)	1.0	2		2500	200	1.8		Budds Farm Supplies Pty. Ltd.
"Peerless" Chicken Mash	18.5	4.0	6.5	0.9	0.7		1.0		2	2000	135	1.6		E. Bussey & Company
C.P.A. Athmaze Chick Mash	18.0	3.5	7.0	1.1	1.3		1.0		2			1.6		Causeway Produce Agency
"J.P.C." Chick Mash	18.5	3.0	6.0	0.6	0.7		1.0	4				1.6		J. P. Cranley Pty. Ltd.
"Promax" Chicken Mash	18.5	4.0	6.5	0.9	0.7		1.0		2	2000	135	1.6		Dalgety & Co. Ltd.
Enrights "Chick Starter" Mash	19.3	3.5	5.0	1.2	1.4		1.0	6				1.6		Enrights Pty. Ltd.
G.P.A. Chicken Mash	18.0	3.5	6.5	1.0	1.2		1.0		2			1.6		Gabba Produce Agency
Grice's Chick Mash	18.0	4.0	7.0	0.4	0.5		1.0	8				1.6		Grice & Company
Henry's 'Universal' Chicken Mash	20.5	4.0	7.0	1.1	1.6	0.2(o)	1.0		2			1.6		Henry Brothers
"Supreme" Chick Mash	18.5	4.0	6.5	0.9	0.7		1.0		2	2000	135	1.6		Innisfail Stores Pty. Ltd.
Double "J" Chick Mash	18.5	3.0	6.0	0.6	0.7		1.0	4				1.6		J. Jackson & Co. (P. & S.) Pty. Ltd.
Lambert's Chick Mash	18.0	4.0	7.0	0.4	0.5		1.0	8				1.6		G. & W. Lambert Ltd.

"Red Star" Battery Mash	19.0	4.5	6.5	0.9	1.5		1.0	2		3000	200	1.6		Lynch & Pollock Pty. Ltd.
"Red Star" Chicken Mash	18.0	4.0	7.0	0.9	1.5		1.0	2		1500	150	1.6		Lynch & Pollock Pty. Ltd.
"Hyval" Chicken Mash	18.0	2.4	7.0	0.25	0.3	1.0 (o)	1.0	4				1.6	2.0	McCartney & Sons
Paramount Chicken Mash	20.0	4.0	6.0	1.5	2.0		1.0		2			1.6		Paramount Produce Agency
R.G.P. Standard Chicken Mash	18.0	3.0	6.0	0.4	0.5		1.0		2	2000	200	1.6		R. G. Patterson
"Red Comb" Battery Chicken Mash	18.0	2.5	6.5	0.6	0.7		1.0	4		3850	386	1.6		Poultry Farmers' Co-op. Society Ltd.
"Red Comb" "Hypro" Chicken Mash	18.0	2.5	6.5	0.6	0.7		1.0	4				1.6		Poultry Farmers' Co-op. Society Ltd.
P.D.S. Battery Chicken Mash	18.0	3.5	7.0	0.5	0.6		1.0		2	2000	135	1.6		The Producers' Co-operative Distributing Society Ltd.
Cerevite Chick Food	18.0	4.0	7.0				1.0		2			1.6		Queensland Cereal Industries Pty. Ltd.
John Robinson's Superior Chicken Mash	18.0	3.0	6.0	0.5	0.6		1.0		2			1.6		John Robinson
"I.X.L." Chicken Mash	18.0	4.0	7.0	0.9	1.5		1.0	2		1500	150	1.6		R. A. Tulloch
						GROWING MASH								
Magnetic Growing Mash	16.4	3.5	9.0	0.5	0.5		1.0							Samuel Allen & Sons Ltd.
"Supastok" Growing Mash	16.5	2.5	7.5	0.4	0.5	1.0 (b)	1.0							Barnes Milling Limited
"Supastok" Growing Mash with Vitamins A + D_3 Added	16.5	2.5	7.5	0.4	0.5	1.0 (b)	1.0			2000	200			Barnes Milling Limited
"Sure Growth" Growing Mash	16.0	4.0	5.0	0.7	0.6		1.0							Con. Bowdler
Budds Poultry Growing Mash	20.0	2.6	4.2	0.3	0.5	0.7 (d)	1.0							Budds Farm Supplies Pty. Ltd.
"BF" Growing Mash	16.5	2.5	7.5	0.4	0.5	1.0 (b)	1.0							Burrell Fenton & Co. Pty. Ltd.
Peerless Growing Mash	16.4	3.5	9.0	0.5	0.5		1.0							E. Bussey & Co.
C.P.A. Athmaze Growing Mash	16.5	3.4	7.0	1.2	1.5		1.0							The Causeway Produce Agency
J.P.C. Growing Mash	17.5	3.0	6.0	0.6	0.7		1.0							J. P. Cranley Pty. Ltd.
"Promax" Growing Mash	16.4	6.0	9.0	0.5	0.5		1.0							Dalgety & Co. Ltd.
"HDS" Brand Growing Mash	16.0	3.0	8.0	0.6	0.7		1.0							Henry Dean & Sons Pty. Ltd.
Douglas' Growing Mash	16.0	3.0	8.0	0.4	0.5	0.5 (b)	1.0	8						R. D. Douglas & Co.
Enrights Growing Mash	16.5	3.0	7.5				1.0							Enrights Pty. Ltd.
"Valley" Growing Mash	17.5	3.0	6.0	0.6	0.7		1.0							G. Fleming & Co. Pty. Ltd.
G.P.A. Growing Mash	16.0	3.5	7.5	0.8	0.9		1.0							Gabba Produce Agency
Grice's Growing Mash	16.0	3.0	8.0	0.4	0.5	0.5 (b)	1.0	8						Grice & Company
Henry's 'Universal' Growing Mash	16.0	3.0	8.0	0.7	0.8	0.8 (o)	1.0							Henry Brothers
Hooper's Growing Mash	16.0	3.0	8.0	0.4	0.5	0.5 (b)	1.0	8						H. T. Hooper & Co.

Name of Preparation	Guaranteed Analysis								Queensland Primary Dealer
	Min. Crude Protein %	Min. Crude Fat %	Max. Crude Fibre %	Min. Phos. Acid (P_2O_5) from bone %	Min. Lime (CaO) from bone %	% Min. Lime (CaO)	% Max. Salt	Miscellaneous	
					GROWING MASHES (contd.)				
"Supreme" Growing Mash	16.4	6.0	9.0	0.5	0.5		1.0		Innisfail Stores Pty. Ltd.
Double "J" Growing Mash	17.5	3.0	6.0	0.6	0.7		1.0		J. Jackson & Co. (P. & S.) Pty. Ltd.
Lambert's Growing Mash	16.0	3.0	8.0	0.4	0.5	0.5 (b)	1.0	8 oz./ton manganese sulphate	G. & W. Lambert Ltd.
"Red Star" Growing Mash	16.0	3.0	7.0	0.8	1.2	0.5 (b)	1.0		Lynch & Pollock Pty. Ltd.
"Non-Stop" Growing Mash	16.0	2.4	7.0	0.25	0.3	1.0 (o)	1.0	2.0% Max. charcoal	McCartney & Sons
Mould's Growing Mash No.1	19.0	3.5	8.0						A. A. Mould & Co.
Mould's Growing Mash No.2	19.0	4.0	7.0						A. A. Mould & Co.
Paramount Growing Mash	17.0	3.5	7.0	1.2	1.5		1.0		Paramount Produce Agency
"R.G.P." Growing Mash	17.0	2.5	6.0				1.0		R. G. Patterson
"Red Comb" Growing Mash	16.0	3.5	7.0	0.57	0.69		1.0	4 oz./ton manganese sulphate	Poultry Farmers Co-op. Society Ltd.
P.D.S. Vitaminised Growing Mash	16.0	3.5	9.0	0.5	0.5	1.3 (v)	1.0	2000 i.u./lb. Vitamin A 135 i.u./lb. Vitamin D_3	The Producers' Co-operative Distributing Society Ltd.
Cerevite Growing Mash	16.0	3.0	8.0	0.5	0.65	1.2 (o)	1.0		Queensland Cereal Industries Pty. Ltd.
C.M.A. Growing Mash	16.0	3.0	6.5	0.5	0.6		1.0	4.5% Max. screenings	The Queensland Co-op. Milling Assn. Ltd.
"Hibiscus" Growing Mash	18.0	3.0	7.0	0.25	0.3	0.75 (b)	1.0		Queensland Pastoral Supplies Pty. Ltd.
John Robinson's Superior Growing Mash	16.0	3.0	6.0	0.7	0.8		1.0		John Rooinson
"I.X.L." Growing Mash	16.0	3.0	7.0	0.8	1.2	0.5 (b)	1.0		R. A. Tulloch
Farmil Growing Mash	17.4	3.2	7.0	0.6	0.7	1.0 (b)	1.0		Warwick Flour Mills

GROWING PELLETS

"Supastok" Growing Pellets	16.5	2.5	7.5	0.4	0.5	1.0 (b)	1.0		Barnes Milling Limited
"Supastok" Growing Pellets with Vitamins A + D_3 Added	16.5	2.5	7.5	0.4	0.5		1.0	2000 i.u./lb. Vitamin A 200 i.u./lb. Vitamin D_3	Barnes Milling Limited

LAYING MASH

"Magnetic" Laying Mash	17.8	3.5	9.0	0.4	0.5		1.0		Samuel Allen & Sons Ltd.
Anderson's "Apex" Laying Mash	18.0	3.0	7.0	0.25	0.3		1.0		Andersons
Athmaze Laying Mash	18.0	4.5	5.5	2.0	2.4		1.0		The Atherton Tableland Maize Marketing Board
"Supastok" Laying Mash	17.5	2.5	8.0	0.3	0.4	1.0 (b)	1.0		Barnes Milling Limited
"Supastok" Laying Mash with Vitamins A + D_3 Added	17.5	2.5	8.0	0.3	0.4	1.0 (b)	1.0	3000 i.u./lb. Vitamin A 300 i.u./lb. Vitamin D_3	Barnes Milling Limited
Bona Vista Bundy Laying Mash	17.0	3.0	7.0	1.5	1.8	1.0 (w)	1.0	4 oz./ton manganese sulphate	Bona Vista Electric Hatchery
Bona Vista Laying Mash	17.0	3.0	7.0	0.5	0.6		1.0	4 oz./ton manganese sulphate	Bona Vista Electric Hatchery
"Sure Egg" Laying Mash	17.0	3.0	7.0	0.5	0.4		1.0		Con. Bowdler
Budds "Eggmaker" Laying Mash	17.0	4.0	7.5	0.7	0.8	1.2 (d)	1.0		Budds Farm Supplies Pty. Ltd.
"Shur-Lay" Laying Mash	17.0	2.5	8.5	0.6	0.7		1.0		Burnett Produce Co.
"BF" Laying Mash	17.5	2.5	8.0	0.3	0.4	1.0 (b)	1.0		Burrell Fenton & Co. Pty. Limited
Peerless Laying Mash	17.8	3.5	9.0	0.4	0.5		1.0		E. Bussey & Co.
C.P.A. Athmaze Laying Mash	17.0	3.0	6.0				1.0		The Causeway Produce Agency
"Acme Laying Mash	17.0	3.0	7.0	0.6	0.7		1.0		W. G. Cox & Co.
"Cranleys" Laying Mash	17.0	2.5	8.5	0.6	0.7		1.0		J. P. Cranley Pty. Ltd.
"J.P.C." Laying Mash	19.0	2.5	8.0	0.7	0.8		1.0		J. P. Cranley Pty. Ltd.
"Promax" Laying Mash	17.8	3.5	9.0	0.4	0.5		1.0		Dalgety & Co. Ltd.
Sheaf Brand Laying Mash	17.1	2.5	6.5	0.9	1.1		1.0		R. Davis & Sons
"HDS" Brand Laying Mash	17.0	2.5	8.0	0.7	0.8		1.0		Henry Dean & Sons Pty. Ltd.
Douglas' Laying Mash	17.7	3.7	9.0			0.5 (b)	1.0		R. D. Douglas & Co.
Enrights Laying Mash	17.5	3.0	7.0	0.35	0.4	0.7 (x)	1.0		Enrights Pty. Ltd.
Enright's Laying Mash with A + D_3	17.0	4.0	7.0	0.8	0.9	0.5 (b)	1.0	3000 i.u./lb. Vitamin A 300 i.u./lb. Vitamin D_3	Enrights Pty. Ltd.
Valley Laying Mash	19.0	2.5	8.0	0.7	0.8		1.0		G. Fleming & Co. Pty. Ltd.
Foley Brothers Laying Mash	17.0	3.0	7.0	0.6	0.7		1.0		Foley Bros. Pty. Ltd.
"Layegg" Laying Mash	17.0	2.4	7.5	0.8	0.9		1.0	2.0% Max. charcoal	Gabba Produce Agency
Grice's Laying Mash	17.0	2.1	9.0	0.4	0.5	0.5 (b)	1.0		Grice & Company
Harper's Poultry Food Laying Mash	18.7	3.4	9.0	1.2	1.4		1.0		Robert Harper & Co. Ltd.

Name of Preparation	Guaranteed Analysis								Queensland Primary Dealer
	Min. Crude Protein %	Min. Crude Fat %	Max. Crude Fibre %	Min. Phos. Acid (P_2O_5) from bone %	Min. Lime (CaO) from bone %	Min. Lime (CaO) %	Max. Salt %	Miscellaneous	
LAYING MASH (contd.)									
Henry's 'Universal' Laying Mash	17.0	3.0	9.0	0.7	1.0	0.6 (v)	1.0		Henry Brothers
Hooper's Laying Mash	17.0	2.1	9.0	0.4	0.5	0.5 (b)	1.0		H. T. Hooper & Co.
"Supreme" Laying Mash	17.8	3.5	9.0	0.4	0.5		1.0		Innisfail Stores Pty. Ltd.
Double "J" Laying Mash	19.0	3.0	8.0	0.7	0.8		1.0		J. Jackson & Co. (P. & S.) Pty. Ltd.
"Jacksons" Laying Mash	19.0	3.0	8.0	0.7	0.8		1.0		J. Jackson & Co. (P. & S.) Pty. Ltd.
"Sunland" Laying Mash	17.0	2.5	7.0	0.6	0.7		1.0		J. Jackson & Co. (P. & S.) Pty. Ltd.
"Williams" Laying Mash	17.0	2.5	7.0	0.6	0.7		1.0		J. Jackson & Co. (P. & S.) Pty. Ltd.
A.J.F. Laying Mash	17.2	0.3	0.7	0.9	1.0		1.0		D. K. Jull
"Laidlaws" Laying Mash	17.0	3.0	7.0	0.6	0.7		1.0		G. Laidlaw & Co.
"Laywell" Laying Mash	17.0	2.5	8.5	0.6	0.7		1.0		G. Laidlaw & Co.
Lambert's Laying Mash	17.0	2.1	6.5	0.4	0.5	0.5 (b)	1.0		G. & W. Lambert Ltd.
"Red Star" Laying Mash	17.0	3.5	7.0	1.0	2.0	1.0 (b)	1.0		Lynch & Pollock Pty. Ltd.
Moregg Laying Mash	17.0	2.4	7.0	0.5	0.7	0.8 (o)	1.0	2.0% Max. charcoal	McCartney & Sons
Mould's Laying Mash No.1	19.0	4.5	6.5						A. A. Mould & Co.
Mould's Laying Mash No.2	19.0	4.0	6.5						A. A. Mould & Co.
Paramount Laying Mash	18.0	3.7	7.0	1.6	2.0		1.0		Paramount Produce Agency
"Red Comb" Laying Mash	17.0	1.7	7.0	0.3	0.3		1.0	4 oz./ton manganese sulphate	Poultry Farmers' Co-op. Society Ltd.
Red Comb Laying Cage Ration	17.0	1.7	7.0	0.3	0.3	0.25(b)	0.5	4 oz./ton manganese sulphate 3850 i.u./lb. Vitamin A 386 i.u./lb. Vitamin D_3	Poultry Farmers' Co-op. Society Ltd.

"P.D.S." Laying Mash	17.0	3.0	9.0	0.6	0.6	2.0 (v)	1.0		The Producers Co-operative Distributing Society Ltd.
Bundaberg Laying Mash	19.0	4.0	4.5	1.8	2.2		1.0		Protein Stock Foods Pty. Ltd.
Cerevite Laying Mash	17.0	3.0	7.0	0.7	0.9	1.2 (o)	1.0		Queensland Cereal Industries Pty. Ltd.
C.M.A. Laying Mash	17.0	3.0	6.0	0.7	0.8		1.0	7.5% Max. screenings	The Queensland Co-operative Milling Assn. Ltd.
John Robinson's Superior Laying Mash	17.0	3.0	6.0	0.7	0.8		1.0		John Robinson
"White Wing" Laying Mash	17.0	2.9	9.0				1.0	0.49 % sulphur (S) as powdered sulphur 0.049% magnesium (Mg) as Magnesium sulphate	H. Siemon Pty. Ltd.
"I.X.L." Laying Mash	17.0	3.5	7.0	1.0	2.0	1.0 (b)	1.0		R. A. Tulloch
LAYING PELLETS									
"Supastok" Laying Pellets	17.5	2.5	8.0	0.3	0.4	1.0 (b)	1.0		Barnes Milling Limited
Supastok Laying Pellets with Vitamins A + D_3 Added	17.5	2.5	8.0	0.3	0.4	1.0 (b)	1.0	3000 i.u./lb. Vitamin A 300 i.u./lb. Vitamin D_3	Barnes Milling Limited

SCRATCH GRAINS

	Materials of Composition	
Bona Vista Chick Grain	Crushed Maize, Sorghum, and Wheat	Bona Vista Electric Hatchery
"Sure Health" Chick Feed	Wheat, Maize, Sorghums, Oats, Peas, and Japanese Millet	Con. Bowdler
Budds "Extra Special" Chicken Kibbles	Wheat, Maize and Oats	Budds Farm Supplies Pty. Ltd.
H.D.S. Chick Food	Maize, Wheat and Sorghum	Henry Dean & Sons Pty. Ltd.
Chick Food	Maize, Wheat, Sorghum, Millet and Shell Grit	McCartney & Sons
"Red Comb" Chick Feed	Oats, Sorghum, Wheat, Maize and Peas	Poultry Farmers' Co-op. Society Ltd.
C.M.A. Chick Food	Kibbled Sorghum, Wheat and Maize, Blue Peas, Rolled Oats, Canary and Panicum Seed	The Queensland Co-operative Milling Assn. Ltd.
Farmil Chick Feed	Panicum, Cracked Sorghum, Maize and Canary Grain	Warwick Flour Mills

Name of Preparation	Guaranteed Analysis								Queensland Primary Dealer
	Min. Crude Protein %	Min. Crude Fat %	Max. Crude Fibre %	Min. Phos. Acid (P_2O_5) from bone %	Min. Lime (CaO) from bone %	Min. Lime (CaO) %	Max. Salt %	Miscellaneous	
STOCK MEALS AND/OR MIXTURES									
Addis Stokmix	10.5	2.5	8.0			1.5 (v)	2.0		Addis Bros. Pty. Ltd.
Athmaze Mixed Meal	11.0	4.0	6.5				1.0		The Atherton Tableland Maize Marketing Board
Stockmeal	10.0	1.5	2.0						Barnes Milling Limited
"Supastok" Special Cow Meal	16.0	2.5	8.5	0.5	0.6	1.0 (b)	1.3		Barnes Milling Limited
Budds Sweet Cattle Meal	9.0	3.0	6.5						Budds Farm Supplies Pty. Ltd.
Stock Meal	10.5	2.2	6.0						Henry Dean & Sons Pty. Ltd.
"Co-op. Superfeed Stock Meal"	11.0	1.5	6.5						Farmers Co-op. Trading Society (Gympie) Ltd.
Double "J" Sorghum Mix	9.0	2.2	7.0				2.5	8.3% Max. molasses	J. Jackson & Co. (P. & S.) Pty. Ltd.
Double "J" Stock Meal	12.5	1.6	4.0						J. Jackson & Co. (P. & S.) Pty. Ltd.
"Jacksons" Stock Food	10.0	2.5	5.0						J. Jackson & Co. (P. & S.) Pty. Ltd.
"Jacksons" Stock Meal	11.0	2.5	7.0						J. Jackson & Co. (P. & S.) Pty. Ltd.
"Lamberts" Stock Meal	11.0	2.5	4.0						G. & W. Lambert Ltd.
Lamberts' Stock Mix	12.0	2.0	7.0			1.0 (b)	1.5		G. & W. Lambert Ltd.
Mould's Stock Meal	12.0	2.4	7.0						A. A. Mould & Co.
Mould's Special Stock Meal	16.5	3.0	7.0						A. A. Mould & Co.
"NB" Stock Meal	16.0	3.4	6.5	1.2	1.5	0.5 (b)	1.5		Nicholls Bros.
Osmonds Codlivine for all Stock	20.0	12.0	9.0	3.0	3.5			0.18% Min. iron (Fe) as red oxide of iron	Osmond & Sons (Aust.) Pty. Ltd.
"Red Comb" Stock Mixture	12.1	1.8	5.0	1.25	1.5		1.0		Poultry Farmers' Co-op. Society Ltd.

"Prolas" Stock Food	12.0	1.5	13.5	1.2 1.7(h)	1.4	2.2 (h)	4.0	30.0% Max. molasses	Protein Stock Foods Pty. Ltd.
Cerevite Cyclone	16.0	3.2	4.0						Queensland Cereal Industries Pty. Ltd.
Cerevite Stock Meal	11.0	2.5	7.5						Queensland Cereal Industries Pty. Ltd.
Cerevite Stock Food	18.0	3.0	7.5	0.5	0.6	1.3 (b)	1.5		Queensland Cereal Industries Pty. Ltd.
Cerevite Utility Mash	12.5	2.2	8.4			1.0 (v)	1.5	5.1% Max. molasses	Queensland Cereal Industries Pty. Ltd.
Sorgumol	9.0	2.2	7.0				3.5	12.0% Max. molasses	Queensland Cereal Industries Pty. Ltd.
Stock Meal	10.0	2.0	10.0						Queensland Co-operative Milling Assn. Ltd.
"HR" Stockmeal	10.0	2.0	4.5			0.5 (b)			S. H. Skinner & Co.
"S.P.A." Stock Meal	10.25	3.25	8.0						State Produce Agency Pty. Ltd.
Farmil Stock Meal	12.7	2.3	6.5						Warwick Flour Mills

Name of Preparation	Guaranteed Analysis							Queensland Primary Dealer
	Min. Phosphoric Acid (P_2O_5) %	Min. Lime (CaO) %	Max. Salt %	Min. Iron (Fe) as Iron Sulphate %	Min. Sulphur (S) as ground sulphur %	Potassium Iodide ozs./ton.	Miscellaneous	
LICKS AND MINERAL SUPPLEMENTS								
Proto-Lick							17.0 % Min. crude protein 80.0 % Max. molasses	The Australian Estates Co. Ltd.
Mindif Mineral Licks	0.44(c)	0.52(c) 2.31(b) 1.18(u)	87	0.12 0.24(y)	0.09		0.03% Min. cobalt (Co) as cobalt chloride 0.3 % Min. copper (Cu) as copper sulphate 0.08% Min. iodine (I) as potassium iodide 0.01% Min. manganese (Mn) as manganese sulphate 0.16% Min. potassium (K) as potassium sulphate	Boots Pure Drug Co. (Aust.) Pty. Ltd.
Super Mindif	24.5 (c)	24.5 (c)	30	0.24(y)	0.75		0.03% Min. cobalt (Co) as cobalt sulphate 0.18% Min. copper (Cu) as copper sulphate 0.025% Min. iodine (I) as potassium iodide 0.05% Min. manganese (Mn) as manganese sulphate	Boots Pure Drug Co. (Aust.) Pty. Ltd.
Budds Aniseed Stock Lick	10.0 (a)	12.5 (a) 8.0 (d)	35		5.0			Budds Farm Supplies Pty. Ltd.
Imperial Bone and Salt Lick	15.0 (c)	18.0 (c)	36					The Central Queensland Meat Export Co. Ltd.

Bio Ovatine for Fowls				5.87		20.6	0.03% Min. cobalt (Co) as cobalt chloride 0.41% Min. copper (Cu) as copper sulphate 7.3 % Min. magnesia (MgO) as magnesium sulphate 2.19% Min. manganese (Mn) as manganese sulphate	F. H. Faulding & Co. Ltd.
Por-Co-Vite	6.21(m) 12.93(h)	7.95(m) 16.57(h) 4.8 (d)	14	0.62(z)	9.6	23.0	3oz./ton cobalt chloride 7.2lb./ton copper sulphate 3.6 % Max. cod liver oil 2.6 % Min. sodium sulphate (anhydrous)	Goldsbrough, Mort & Co. Ltd.
Vita-Lick Concentrated Cattle Lick	11.9 (c) 16.3 (h)	15.3 (c) 20.8 (h)		3.5 (z)	0.45	16.0	15oz./ton cobalt chloride 15lb./ton copper sulphate 3.0 % Min. sodium sulphate (glauber's salt)	Goldsbrough, Mort & Co. Ltd.
Vita-Lick Concentrated "D"	12.0 (m) 10.5 (h)	15.4 (m) 14.7 (h)		1.3 (z)	2.0	8.0	20.0 % Max. rice pollard 1.8 % Min. sodium sulphate (anhydrous)	Goldsbrough, Mort & Co. Ltd.
Vita-Lick Concentrated "D" (Cobaltised & Copperised)	12.0 (m) 10.5 (h)	15.4 (m) 14.7 (h)		1.3 (z)	2.0	8.0	15oz./ton cobalt chloride 15lb./ton copper sulphate 20.0 % Max. rice pollard 1.8 % Min. sodium sulphate (anhydrous)	Goldsbrough, Mort & Co. Ltd.
"Pigalik"	10.0 (a)	12.0 (a) 10.0 (b)	21				21.0 % Max. charcoal	Hayes Veterinary Co.
"Q-Lik"	18.75(a)	22.5 (a)	11	0.28	1.9		9.0 % Max. bran 0.22% Min. magnesia (MgO) as magnesium sulphate 2.5 % Max. molasses	Hayes Veterinary Co.
Olsson's Improved Salt Blocks - Iodised		10.0 (b)	85			8.0		L. P. Jensen
Olsson's Improved Salt Blocks - Sulphur & Calcium		10.0 (b)	83		1.9			L. P. Jensen
Olsson's Improved Salt Blocks - Phosphorised	3.0 (a)	4.0 (a) 10.0 (b)	75					L. P. Jensen
"Vetsolick" Mineral Concentrate	11.0 (a)	14.0 (a)		1.5	16.6	20.0	0.7 % Min. magnesia (MgO) as magnesium sulphate 26.5 % Max. wheat meal	A. H. McDonald & Co.

Name of Preparation	Guaranteed Analysis							Queensland Primary Dealer
	% Min. Phosphoric Acid (P_2O_5)	% Min. Lime (CaO)	% Max. Salt	Min. Iron (Fe) as Iron Sulphate %	% Min. Sulphur (S) as ground sulphur	Potassium Iodide ozs./ton	Miscellaneous	
LICKS AND MINERAL SUPPLEMENTS (contd.)								
Vetamac Medicated Lick	5.7 (a)	7.5 (a)	53	0.7	4.0	20	0.1 % Min. magnesia (MgO) as magnesium sulphate 6.0 % Max. molasses 13.6 % Max. wheat meal	A. H. McDonald & Co.
Osmonds Concentrated Lick for Cattle	9.0 (c)	12.0 (c) 6.6 (d)		0.4	2.2	15	1.3 % Min. magnesia (MgO) as magnesium sulphate 31.0 % Max. meals from meat and bone, linseed, barley, rice and cocoa bean shell	Osmond & Sons (Aust.) Pty. Ltd.
Osmonds Mineral Concentrate for Sheep	11.0 (c) 16.0 (h)	13.0 (c) 19.0 (h)		0.45		16	0.35% Min. magnesia (MgO) as magnesium sulphate 10.0 % Max. rice meal	Osmond & Sons (Aust.) Pty. Ltd.
Osmonds "Toneca" Stock Lick	7.0 (c)	8.0 (c) 2.5 (d)	70	0.19	2.0	14	0.15% Min. magnesia (MgO) as magnesium sulphate	Osmond & Sons (Aust.) Pty. Ltd.
"Red Comb" Iodised Stock Lick	1.2 (c)	1.5 (c)	95	0.3	0.5	4.4	0.3 % Min. magnesia (MgO) as magnesium sulphate	Poultry Farmers' Co-op. Society Ltd.
Phoscalick	11.4 (h)	14.6 (h) 14.2 (b)	19				2oz./cwt. copper sulphate 2.5 % Max. molasses 9.0 % added water	Protein Stock Foods Pty. Ltd.
Calcium and Trace Element Manger Block	5.0 (a)	7.0 (a) 10.0 (d) 3.0 (e)		0.03		20	5oz./ton cobalt chloride 20oz./ton copper sulphate 40oz./ton manganese sulphate 0.15% Min. magnesia (MgO) as magnesium sulphate 41.0 % Max. molasses	Queensland Pastoral Supplies Pty. Ltd.

Hart's Calcium Phosphate Manger Block	5.8 (a)	7.0 (a) 9.0 (d) 3.0 (e)					42.0 % Max. molasses	Queensland Pastoral Supplies Pty. Ltd.
Hart's Magnesium Sulphate Manger Block		22.0 (d) 3.0 (e)					0.8 % Min. magnesia (MgO) as magnesium sulphate 40.0 % Max. molasses	Queensland Pastoral Supplies Pty. Ltd.
The Henry Lamond Special Lick	10.0 (a)	12.0 (a)	52				0.013% Min. cobalt (Co) as cobalt chloride 11.0 % Max. molasses	Queensland Pastoral Supplies Pty. Ltd.
Hibiscus Cattle Lick	9.75(a)	12.0 (a) 7.5 (b)	42		4.5		5.5 % Max. molasses	Queensland Pastoral Supplies Pty. Ltd.
Hibiscus Salt Block (Iodized)			99	0.29(y)		5		Queensland Pastoral Supplies Pty. Ltd.
Hibiscus Salt Block (Roklik)			100	0.1 (y)				Queensland Pastoral Supplies Pty. Ltd.
Hibiscus Salt Block (Sulphurized)			99		1.8			Queensland Pastoral Supplies Pty. Ltd.
Hibiscus Sheep Lick	6.5 (a)	8.0 (a) 7.5 (b)	32	0.38	3.5		5.5 % Max. molasses	Queensland Pastoral Supplies Pty. Ltd.
Hibiscus "Stok-Lik" Concentrate, with trace elements	15.0 (a)	18.0 (a) 11.0 (d)		0.425		16	18.0 % Min. crude protein 0.011% Min. cobalt (Co) as cobalt chloride 0.115% Min. copper (Cu) as copper sulphate 0.017% Min. manganese (Mn) as manganese sulphate 0.01% Min. zinc (Zn) as zinc sulphate 16.0 % Max. peanut meal	Queensland Pastoral Supplies Pty. Ltd.
Medicated Salt Block	1.0 (f)	1.0 (f) 0.5 (d) 1.5 (g)	93				2.0 % Max. molasses	Queensland Pastoral Supplies Pty. Ltd.
Ram Salt Lick			100					Rennie & McGlew Pty. Ltd.
Ram-Lic (Medicated)			98		2.8			Rennie & McGlew Pty. Ltd.
Rawleigh's Mineralized Supplement for Stock Iodized	12.0 (l) 0.23(k)	10.24(l) 16.75(d)	15	1.03	3.5	13.4	17.92oz./ton cobalt sulphate 2.0 % Max. molasses	Robinson & Bott Pty. Ltd.

Name of Preparation	Guaranteed Analysis							Queensland Primary Dealer
	Min. Phosphoric Acid (P_2O_5) %	% Min. Lime (CaO)	% Max. Salt	Min. Iron (Fe) as Iron Sulphate %	Min. Sulphur (S) as ground sulphur %	Potassium Iodide ozs./ton	Miscellaneous	
LICKS AND MINERAL SUPPLEMENTS (contd.)								
Rawleigh's Poultry Powder Iodized	8.71(a) 7.97(l)	10.72(a) 6.8 (l) 13.21(d) 8.0 (o)		0.39	4.0	6.7	17.92oz./ton cobalt sulphate 6.72oz./ton copper sulphate 17.92oz./ton manganese sulphate 17.92oz./ton zinc sulphate	Robinson & Bott Pty. Ltd.
"Ranch" Brand Concentrated Minerals for Cattle, Sheep, & Horses	26.8 (f)	30.7 (f)	18	0.31			0.031% Min. cobalt (Co) as cobalt sulphate 0.29 % Min. copper (Cu) as copper sulphate 0.024% Min. iodine (I) as potassium iodide 0.053% Min. manganese (Mn) as manganese sulphate	L. Uhl & Sons Pty. Ltd.
Vic-Lic Calcium-Molasses Salt Block	0.6 (a)	0.8 (a) 15.0 (b)	65				6.0 % Max. molasses	Wilcox Mofflin Ltd.
Vic-Lic Concentrated Cattle Lick	27.0 (h)	36.0 (h)	5½	2.9		16		Wilcox Mofflin Ltd.
Vic-Lic "D" Concentrated Sheep Lick	29.0 (h)	38.0 (h)		2.9		16	2.0 % Min. sodii (Na_2SO_4) as sodii sulphate exsiccata	Wilcox Mofflin Ltd.
Vic-Lic "D" Ready Mixed Sheep Lick	5.0 (h)	6.4 (h)	78	0.5 (z)		3	5.5 % Max. molasses 0.4 % Min. sodii sulphate (exsiccata)	Wilcox Mofflin Ltd.
Vic-Lic "G" Concentrated Sheep Lick	28.0 (h)	37.0 (h)		5.8 (z)		16		Wilcox Mofflin Ltd.

Vic-Lic "G" Ready Mixed Sheep Lick	4.7 (h)	6.0 (h)	78	1.1		3	5.5 % Max. molasses	Wilcox Mofflin Ltd.
Vic-Lic Mineralized Salt Block	4.5 (h)	6.0 (h) 13.5 (b)		1.25		3	0.16% Min. magnesia (MgO) as epsom salts 3.0 % Max. molasses	Wilcox Mofflin Ltd.

Name of Preparation	Guaranteed Analysis							Queensland Primary Dealer
	Min. Crude Protein %	Min. Crude Fat %	Max. Crude Fibre %	Min. Phos. Acid (P_2O_5) %	Min. Lime (CaO) %	Max. Salt %	Miscellaneous	
POULTRY FOOD CONCENTRATES								
Egg-O-Vite	36.0	7.5	2.5	10.0(n)	13.0(n)	7.0	0.17% Min. iron (Fe) as sulphate of iron 0.05% Min. iron (Fe) as red oxide of iron 0.7 % Min. sodium sulphate (glauber's salts) 0.5 % Min. sulphur (S) as flowers of sulphur 2.5 % Max. coconut meal 10.0 % Max. linseed meal 4.5 oz./ton potassium iodide	Goldsbrough, Mort & Co. Ltd.
Eggo Poultry Concentrate	30.0	7.7	4.2	3.4(a)	4.0(a)	6.0	0.19% Min. iron (Fe) as iron sulphate 0.99% Min. sulphur (S) as flowers of sulphur	McCartney & Sons
Osmonds Codlivine for Poultry	20.0	12.0	9.0	3.0(a)	3.5(a)		0.18% Min. iron (Fe) as red oxide of iron	Osmond & Sons (Aust.) Pty. Ltd.

Addresses of Queensland Primary Dealers appearing in this pamphlet

Addis Bros. Pty. Ltd.	250 Roma St., Brisbane.
Samuel Allen & Sons Ltd.	Flinders St., Townsville.
Andersons	Kingaroy St., Kingaroy.
Annand, Robinson & Co. Pty. Ltd.	282 Ruthven St., Toowoomba.
The Atherton Tableland Maize Marketing Board	Railway Reserve, Atherton.
The Australian Estates Co. Ltd.	100 Creek St., Brisbane.
Barnes Milling Limited	344 Stanley St., South Brisbane.
Bona Vista Electric Hatchery	49 Kensington St., Bundaberg.
Boots Pure Drug Co. (Aust.) Pty. Ltd.	116 Wickham St., Valley, Brisbane.
Thomas Borthwick & Sons (Aust.) Ltd.	Murarrie, Brisbane.
Con. Bowdler	82 Russell St., Toowoomba.
Budds Farm Supplies Pty. Ltd.	Scarborough St., Southport.
Burnett Produce Coy.	Wondai.
Burrell Fenton & Co. Pty. Ltd.	61 Roma St., Brisbane.
E. Bussey & Co.	25 Palmer St., Townsville.
Causeway Produce Agency	Flinders St. West, Townsville.
Central Queensland Co-op. Stock Foods Society Ltd.	East & Stanley Sts., Rockhampton.
The Central Queensland Meat Export Co. Pty. Ltd.	Lakes Creek, Rockhampton.
The Cotton Marketing Board	Woonah Avenue, Whinstanes.
W. G. Cox and Co.	60 Roma St., Brisbane.
J. P. Cranley Pty. Ltd.	Turbot St., Brisbane.
Dalby Milling Company Pty. Ltd.	Eileen St., Dalby.
Dalgety & Co. Ltd.	Sturt St., Townsville.
Darling Downs Co-op. Bacon Assn. Ltd.	Lytton Rd., Doboy, and Willowburn via Toowoomba.
R. Davis & Sons	113 East St., Rockhampton.
Davis Gelatine (Aust.) Pty. Ltd.	62 Eagle St., Brisbane.
Henry Dean & Sons Pty. Ltd.	228 Roma St., Brisbane.
Defiance Milling Co.	279 Ruthven St., Toowoomba.
R. D. Douglas & Co.	806 Ann St., Valley, Brisbane.
The Downs Co-op. Dairy Assn. Ltd.	57 Brook St., Toowoomba.
Enrights Pty. Ltd.	Telemon Rd., Beaudesert.
Esk Co-op. Dairy Assn. Ltd.	Factory Lane, Esk.
Farmers Co-op. Trading Society (Gympie) Ltd.	Tozer St., Gympie.
F. H. Faulding & Co. Ltd.	200 Charlotte St., Brisbane.
G. Fleming & Co. Pty. Ltd.	598 Ann St., Valley, Brisbane.
Foley Bros. Pty. Ltd.	258 Roma St., Brisbane.
Gabba Produce Agency	52 Logan Rd., Woolloongabba.
Gillespie Bros. (Qld.) Pty. Ltd.	Hudson Rd., Albion, Brisbane.
Goldsbrough, Mort & Co. Ltd.	63 Eagle St., Brisbane.
Gollin & Co. Ltd.	70 Eagle St., Brisbane.
Grice & Co.	71 Roma St., Brisbane.
Robert Harper & Co. Ltd.	53 Albert St., Brisbane.
Hayes Veterinary Company	351 Queen St., Brisbane.
Henry Brothers	Forde St., Allora.
H. T. Hooper & Co.	Limestone St., Ipswich.
E. C. Horn	161 Stanley St., South Brisbane.
Hutton & Foggitt Jones	76 Roma St., Brisbane.
Innisfail Stores Pty. Ltd.	Owen St., Innisfail.
J. Jackson & Co. (P. & S.) Pty. Ltd.	56 Roma St., Brisbane.
L. P. Jensen	116 Wickham St., Valley, Brisbane.
D. K. Jull	Ramsay St., Middleridge, Toowoomba.
Kraft Foods Ltd.	249 Toombul Rd., Northgate, Brisbane.

G. Laidlaw & Co.	77 Roma St., Brisbane.
G. & W. Lambert Ltd.	95 Roma St., Brisbane.
Lever Bros. Pty. Ltd.	Murray St., Mayne, Brisbane.
E. J. Lowis	63 Eagle St., Brisbane.
Lynch & Pollock Pty. Ltd.	302 Ruthven St., Toowoomba.
The Maleny Co-op. Dairy Assn. Ltd.	Coral St., Maleny.
McCartney & Sons	Stanley St., Woolloongabba.
A. H. McDonald & Co.	99 Mary St., Brisbane.
A. A. Mould & Co.	Fewtrell St., Palmwoods.
Nicholls Brothers	Drayton St., Nanango.
North Queensland Co-op. Bacon Assn. Ltd.	Mareeba.
Osmond & Sons (Aust.) Pty. Ltd.	500 Stanley St., South Brisbane.
Paramount Produce Agency	Herbert St., Ingham.
R. G. Patterson	89 Tingal Rd., Wynnum Central, Brisbane.
Poultry Farmers Co-op. Society Ltd.	Roma St., Brisbane.
The Producers' Co-op. Distributing Society Ltd.	65 Turbot St., Brisbane.
Protein Stock Foods Pty. Ltd.	Collins St., Bundaberg.
Provincial Traders Pty. Ltd.	Little Roma St., Brisbane.
Queensland Cereal Industries Pty. Ltd.	395 Montague Rd., South Brisbane.
Queensland Co-op. Milling Assn. Ltd.	Stanley St., South Brisbane, and 121 Russell St., Toowoomba.
The Queensland Farmers Co-op. Assn. Ltd.	Jacaranda St., Booval, Ipswich.
Queensland Meat Export Co. Ltd.	113 Eagle St., Brisbane.
Queensland Meat Industry Board	Cannon Hill, Brisbane.
Queensland Pastoral Supplies Pty. Ltd.	27 Bowen St., Brisbane.
Rennie & McGlew Pty. Ltd.	239 Charlotte St., Brisbane.
Robinson & Bott Pty. Ltd.	459 Adelaide St., Brisbane.
John Robinson	107 Russell St., Toowoomba.
H. Siemon Pty. Ltd.	Gill St., Charters Towers.
S. H. Skinner & Co.	Railway Yards, Forest Hill.
State Produce Agency Pty. Ltd.	266 Roma St., Brisbane.
State Wheat Board	Margaret St., Toowoomba.
Swift Australian Co. (Pty.) Ltd.	245 Stanley St., South Brisbane.
Tancred Brothers Pty. Ltd.	Beaudesert Rd., Beaudesert.
R. A. Tulloch	84 Russell St., Toowoomba.
L. Uhl & Sons Pty. Ltd.	Queen St., Brisbane.
Warwick Flour Mills	Mill Hill, Warwick.
Wilcox Mofflin Ltd.	68 Albert St., Brisbane.

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